FARM BUREAU-
FARM MANAGEMENT
SERVICE REPORTS
1925 - 32

CONTENTS

FIRST ANNUAL REPORT

For the Cooperators in the

Farm Bureau-Farm Management Service

For the Year 1925

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The 225 farmers whose records were used in preparing this report, after paying all expenses of operating their farms, without including any allowance for their own labor, lacked $382 of making 5% return on their investment. The average investment per acre, including buildings, livestock and other equipment, was $258.15 per acre. Expressed in another way these men earned 3.21% on their investment, after deducting all expenses of operating their farms and $720 allowance for the value of their own labor.

In addition to the wages allowed a man for his own labor, these farms on an average received the use of produce from the farm which at farm prices was worth $430 per farm. Also the house they lived in was worth $446 per farm each year based on depreciation, upkeep and interest charges. The total value of the living furnished from the farm at farm prices amounted to $876 per farm.

In considering the earnings on these farms it must be recognized that these farms do not represent average farm conditions and average farm earnings. Most of these men own their own farms or else are renting them from relatives, and on the whole they are more productive than the average of all farms of a community in this section of the state. A survey was made of all the farms in one township in the center of the area represented by the 225 farms securing information which would determine the approximate farm earnings. It was found that the 225 cooperators in this project received a return of more than a thousand dollars greater net income per farm for 1925 than those in the one township where very few farm records were kept.

Differences in Earnings Between Farms

There are wide variations in the earnings on the more successful and the less successful farms. The 25 most profitable of the 225 farms made 5% interest on the investment and had $2320 to pay the operator for his own labor and management while the 25 least profitable farms lacked $2404 of making 5% on the investment, and leaving nothing to the operator for his own labor and management.

This amounts to a total difference of $4724 in the return for the the labor and management of the operators between the high and low groups of farms. This may be expressed in another way by saying, after all expenses were paid and the operator allowed $720 for his own labor, the most profitable group made 8.1% on the investment, while the least profitable group lacked .57 of 1% of getting any return for the money invested.

What Accounted for the Difference in Farm Earnings

The important question for the man who was cooperating in this project is to analyze these records and find out what is responsible for the difference in earnings. A satisfactory way of studying the record of any farm is to consider first the gross receipts and total expenses per acre on the farm in comparison with the same figures for the average of all the farms and the average of the more profitable farms. This will enable one to determine whether his farm differs from others in income or in the expenses of operation.

There is little difference in the total expense per acre on the most profitable and least profitable groups of farms, the expenses being $17.72 and $16.32 per acre respectively for the two groups as shown by Table 2. However, the gross receipts per acre are $37.80 per acre on the most profitable farms and only $14.80 per acre on the least profitable group. In other words the most profitable farms with a slightly larger expense per acre received two and a half times as large returns per acre. The same table shows that there was very little difference in the size of farms in the two groups and that the investment per acre was only a little larger on the less profitable farms. It is known that the type of soil originally was as good on the less profitable group of farms as on the better group.

Factors Affecting Farm Income

One of the first things to be considered in relation to farm earnings is the influence of crop yields. The yields per acre on the most profitable group of farms were as follows: corn, 65.7; oats, 43.5; wheat, 22.4 bushels. On the least profitable group, the yields for the same crops were 49.6 bushels; 36.4 bushels, and 25.1 bushels. This shows that the yields of corn and oats were from 20% to 30% higher on the most profitable farms. Wheat yields were slightly higher on the less profitable farms but a small acreage of wheat was grown on this group of farms.

It is also important that one select those crops which will give a large return per acre. This is discussed at greater length later in the report. The percent of land in the different crops should be noted at this time. The more profitable farms grew less oats, less bluegrass, less timothy and more wheat than did the less profitable farms. Also there were slightly more legumes grown on the more profitable farms.

Livestock production also has an important bearing on the returns per acre. It is significant that the more profitable farms with an investment of $14.34 per acre in productive livestock received a return of $27.24 per acre from livestock, while the less profitable group of farms had $9.54 invested and received a return of only $9.10 per acre. The less profitable group of farms with two-thirds of the investment in livestock received one-third as large returns per acre.

The return for $100 feed fed to livestock show that the more profitable farms received $166 in livestock returns for each $100 worth of feed fed while the less profitable received $122.81. In each case the returns for $100 worth of feed fed was greater for cattle, hogs and sheep on the most profitable farms. Likewise, the return for $100 invested in productive live-

stock shows that the most profitable farms received $175.73 for every $100 invested, while the less profitable group received only $120.03. Again the most profitable farms received larger returns from each class of livestock It will also be seen on page 6 that the most profitable farms produced about three times as many hogs per farm and that the cost of feed amounted to only $7.01 per hundred pounds, while on the least profitable group the cost of feed was $9.10 per hundred pounds of pork produced. The difference in feed cost alone of $2.09 for each 100 pounds of pork produced would have amounted to a difference of over $650 larger returns per farm in favor of the most profitable group.

The most profitable farms worked fewer acres of crops with one man than the least profitable group. This would be expected because of the larger amount of livestock and the larger return received per acre from the most profitable group. In terms of labor cost per acre for the entire farm, it will be found that the most profitable farms expended only 15¢ an acre more for labor than did the least profitable group. It may be said then that farms with more livestock require practically no more expense for labor than do the farms with less livestock, but that the keeping of more livestock helps to distribute the labor to better advantage throughout the entire year.

In the use of horse labor the more profitable farms show a smaller cost for feed and depreciation per work horse and a smaller cost per acre of crops grown. Noting the cost of horse labor amounted to $3.00 to $4.00 per acre, one can well give attention to the economy in feeding work horses.

One of the striking differences between the most profitable and the least profitable farms is the relationship of expenses to income. For $100 gross income, it will be noted that the more profitable farms paid out only $46.84, while the less profitable group paid out $110.27. It will be noted in studying the distribution of expenses on the acre basis that there were not wide variations on the acre basis. The big difference is due to the larger size income with a similar expenditure on the better farms.

In considering the income from the farm one can well afford to give attention to the value of the living secured from the farm. It will be noted that on the average the produce received from the farm and used in the home was worth $430.21 at farm prices. If this were converted into retail prices which one would have to pay in the city, the value would be very nearly doubled. One should not make the error of comparing farm income with city incomes without giving the farm full credit for the value of the living secured from it.

Table 1. SUMMARY OF THE YEARS FARM BUSINESS

Your summary as shown on Pages 34 and 35 of your book compared with 225 farms, the twenty-five most profitable and the twenty-five least profitable farms.

	Items	Your farm	Average of 225 farms	25 most profitable farms	25 least profitable farms
1	Capital Investments - Total	$_____	$59890	$52451	$55064
2	Land		44440	39035	40733
3	Farm Improvements		5694	4258	4853
4	Machinery & Equipment		1815	1498	1748
5	Feed, Grain & Supplies		4842	3818	4843
6	Livestock - Total		3099	3842	2887
7	Horses		867	814	899
8	Cattle		1114	1080	993
9	Hogs		864	1635	788
10	Sheep		111	189	79
11	Poultry		140	124	128
12	Bees		3	---	---
13	Receipts & Net Increases - Total	$_____	$ 5356	$ 7987	$ 3084
14	Farm Improvements		8	11	0
15	Feed, Grain & Supplies		2097	2010	1093
16	Labor off the Farm		80	147	27
17	Miscellaneous		25	21	4
18	Livestock - Total		3146	5798	1960
19	Horses		28	43	16
20	Cattle		560	798	265
21	Hogs		1846	3935	1234
22	Sheep		103	235	56
23	Poultry		121	139	95
24	Egg Sales		137	130	81
25	Dairy Sales		346	518	213
26	Bees		5	---	---
27	Expenses & Net Decreases - Total	$_____	$ 2514	$ 2784	$ 2489
28	Farm Improvements		247	208	236
29	Machinery & Equipment		513	485	444
30	Feed, Grain & Supplies		196	544	293
31	Miscellaneous Livestock Exp.		47	59	45
32	Miscellaneous Crop Expense		234	251	201
33	Hired Labor		668	654	648
34	Taxes, Insurance, etc.		493	482	499
35	Miscellaneous Expenses		54	54	59
36	Horses - Decreases		53	45	55
37	Miscellaneous Livestock Decreases		9	2	9
38	Receipts less Expenses	$_____	$ 2842	$ 5203	$ 595
39	Operator's and Family Labor		922	957	910
40	Net Income from Investment		1920	4246	-315

Table 2 - IMPORTANT FACTORS BY WHICH THE FARM BUSINESS MAY BE STUDIED
Underlined factors are the ones used on the chart, Page 7

	Your farm	225 farms	25 most profitable farms	25 least profitable farms
The Farm as a Whole				
Rate earned on investment	_____ %	3.21%	8.10%	- .57%
Labor and Management wage	$	$-382.	$2320.	$-2404.
Gross receipts per acre	_____	23.09	37.83	14.80
Total expense per acre		14.81	17.72	16.32
Net receipts per acre		8.28	20.11	-1.52
Size of farm - acres		232.0	211.1	208.3
Value of land per acre	$	$191.55	$184.89	$195.51
Total investment per acre	$	$258.15	$248.44	$264.30
Crop Production				
Corn - Bushels per acre	_____	55.3	65.7	49.6
Oats - Bushels per acre	_____	39.2	43.5	36.4
Wheat - Bushels per acre	_____	18.3	22.4	25.1
Percent of farm tillable	%	89.7%	86.0%	90.1%
Percent of tillable land in				
Corn	%	44.4%	44.3%	42.2%
Oats	%	26.1%	20.2%	29.1%
Wheat	%	7.0%	11.2%	3.5%
Legumes	%	15.0%	17.0%	16.3%
Bluegrass	%	4.0%	2.5%	4.6%
Timothy	%	1.5%	.8%	1.2%
Miscellaneous	%	1.9%	3.9%	3.1%
All grain and hay crops	%	88.4%	88.1%	87.7%
Livestock Production				
Percent of income from livestock	%	58.3%	72.4%	62.8%
Investment in productive livestock per acre	$	$ 9.62	$ 14.34	$ 9.54
Livestock returns per acre	$	13.29	27.24	9.10
Returns per $100 feed fed to				
All productive livestock	$	150.77	166.00	122.81
Cattle	$_____	105.71	127.09	82.38
Hogs	$_____	172.31	181.45	133.68
Sheep*	$_____	172.19	168.01	130.48
Returns per $100 invested in				
All productive livestock	$	$108.95	$ 175.73	$120.03
Cattle	$	$ 95.61	$ 110.58	$ 65.93
Hogs	$	$212.04	$ 248.11	$179.02
Sheep*	$	$ 70.49	$ 76.58	$ 69.66
Poultry	$_____	$234.37	$ 275.78	$208.75

* Too few sheep kept in area to make results significant.

Table 2 - Continued

	Your farm	225 farms	25 most profitable farms	25 least profitable farms
Livestock Production (Continued)				
Returns per $100 invested in				
Number of eggs per hen		66.3	65.2	61.5
Pounds of pork produced		15508	31971	10596
Feed cost per $100 lbs. of pork	$	$ 7.10	$ 7.01	$ 9.10
Man Labor				
Crop acres per man				
With tractor	_____	91.4	80.1	87.0
Without tractor		86.6	78.4	83.2
Horse Labor				
Crop acres per horse				
With tractor	_____	25.9	24.4	21.0
Without tractor	_____	19.1	18.3	19.4
Feed and depreciation per work horse	$	$ 75.56	$ 74.88	$ 76.93
Feed and depreciation per crop acre	$	$ 3.27	$ 3.40	$ 3.79
Expenses				
Expenses per $100 Gross Income	$_____	$ 64.14	$ 46.84	$ 110.27
Expense per acre of whole farm		14.81	17.72	16.32
Farm improvements		1.07	.99	1.13
Horses		.23	.21	.27
Machinery & equipment all farms		2.21	2.30	2.13
With tractor		(2.46)	(2.66)	(2.70)
Without tractor		(1.66)	(1.57)	(1.60)
Feed, grain and supplies		.85	2.58	1.40
Miscellaneous livestock expense		.20	.28	.22
Miscellaneous crop expense		1.01	1.19	.97
Hired and home labor		6.85	7.63	7.48
Taxes, insurance, etc.		2.12	2.28	2.39
Miscellaneous expenses		.27	.26	.33
Family Living Furnished by Farm				
Farm produce used in home	$	$ 430.21	$ 434.83	$ 413.09
House rent (10% of value)	$	445.60	433.25	384.61
Total living furnished by farm	$	875.81	868.08	797.70
Size of family		4.7	4.9	4.2

Table 3 - FIND YOUR FARM LEAKS

The numbers between the lines across the middle of the page are the averages for the 225 farms used in this summary of the factors named at the tops of the columns. By drawing a line across each column at the number measuring the efficiency of your farm as shown in Table 2, you can compare your efficiency with that of the other farms in the project.

Rate Earned on Investment	Bushels per Acre			Livestock Returns				Crop Acres per Man		Crop Acres per Horse		Expense per $100 Gross Income	Gross Income per Acre
								Tractor		Tractor			
	Corn	Oats	Wheat	Cattle per $100 feed	Hogs per $100 feed	Sheep per $100 feed	Poultry per $100 investment	Yes	No	Yes	No		
10.30	90	74	39	246	277	277	444	147	136	47	40	38.80	44
9.30	85	69	36	226	262	262	414	139	129	44	37	42.40	41
8.30	80	64	33	206	247	247	384	131	122	41	34	46.00	38
7.30	75	59	30	186	232	232	354	123	115	38	31	49.60	35
6.30	70	54	27	166	217	217	324	115	108	35	28	53.20	32
5.30	65	49	24	146	202	202	294	107	101	32	25	56.80	29
4.30	60	44	21	126	187	187	264	99	94	29	22	60.40	26
3.30	55	39	18	106	172	172	234	91	87	26	19	64.00	23
2.30	50	34	15	86	157	157	204	83	80	23	16	67.60	20
1.30	45	29	12	66	142	142	174	75	73	20	13	71.20	17
.30	40	24	9	46	127	127	144	67	66	17	10	74.80	14
-.70	35	19	6	26	112	112	114	59	59	14	7	78.40	11
-1.70	30	14	3	6	97	97	84	51	52	11	4	82.00	8

Profitable Farming and Basis of Study

Profitable farming requires balanced farming. Weaknesses in some parts of the farm business may offset the advantages gained at other points. The more important points to be considered, most of which are well illustrated in the data in this report, include the following:

1. Crop yields
2. Kinds of crops grown
3. Amount of livestock
4. Efficiency with which livestock is fed
5. Use of man labor
6. Use of horse labor and farm power
7. Relationship of expenses to receipts
8. Size of farms

A study of these factors and the management practices affecting the results shows conclusively the importance of these factors on farm earnings. The Department of Farm Organization and Management has conducted different kinds of studies in central Illinois which are valuable in helping analyze the results on farms included in this project. These studies include:

1. Records kept in the Illinois Farm Account Book for 8 to 10 consecutive years, by many farmers in central Illinois.

2. Complete cost of production records secured on 12 to 34 farms annually for the past 13 years.

3. Annual records secured from 40 to 100 tractor operators continuously since 1918. This has enabled making a careful study of farm power costs and the experience of farmers in solving their farm power problems.

4. A special study of the cost of producing hogs conducted on about 40 farms for two years. The purpose of this study was to determine the effect of different methods of handling hogs on the cost of production.

5. Survey records giving the approximate earnings on each farm, secured from practically every farm in one township located in about the center of the area where this project is being conducted. The purpose of this study was to determine how the farms keeping records on this project differ from the average farm of a community in the same area. The difference in earnings of the two groups is stated on Page 1.

It is believed that this combination of studies gives a good basis for making rather definite recommendations to the cooperators as to changes they can profitably make in organizing and operating their own business. The record on each individual farm is essential in order to study in detail the plans and practices followed on each farm and to measure differences in results obtained on the different farms in order to give a definite basis for determining points of strength and weakness on each farm.

In addition to the analysis already made of the farm business it is believed well to give further consideration to farm practices and the influence of certain factors on the total farm earnings.

Table 4. Practices in Soil Treatment followed on Best and Poorest Yielding Fields of Corn, Oats and Wheat on 1180 Brown Silt Loam Soil Fields. Only Fields of ten acres or more were used in making this summary.

	Corn		Oats		Wheat		Three Crops	
	10% best fields	10% poor fields	10% best fields	10% poor fields	10% best fields	10% poor fields	10% best fields	10% poor fields
Number of fields	66	66	42	42	10	10	118	118
Yield- Bu. per Acre	79.3	36.4	58.3	23.9	33.5	13.3	---	---
Phosphated fields [1]	30	3	22	1	5	0	57	4
Partly phos. fields	5	2	5	1	0	1	10	4
Not phosphated fields	31	61	15	40	5	9	51	110
Limed fields [2]	12	7	6	4	6	2	24	13
Partly limed fields	8	4	6	2	1	1	15	7
Not limed fields	46	55	30	36	3	7	79	98
Manured fields [3]	23	14	13	6	6	2	42	22
Partly manured fields	28	15	18	14	3	4	49	33
Not manured fields	15	37	11	22	1	4	27	63
Sweet clover or alfalfa [4]	25	7	12	0	4	0	41	7
Red, mammoth or alsike clover [4]	27	16	14	3	3	1	44	20
Partly clovered fields	5	3	4	9	1	1	10	13
Bluegrass pasture	3	0	0	0	0	0	0	0
No clover	0	40	12	30	2	8	20	78
Clover or manure and phosphate	27	3	14	0	5	0	46	3
Some clover or some manure and some phosphate	8	1	11	2	0	1	19	4
No clover, no manure, no phosphate	3*	25	0	17	0	3	3	45

1. "Phosphated field" as used here means a field which has been completely covered with more or less rock phosphate during past years.

2. "Limed field" means a field which has been entirely covered with more or less limestone during the past.

3. "Manured field" means a field which has been covered with more or less manure during the five years 1921 to 1925 inclusive.

4. Wherever the term "clover" is used, it means that the field has been left in clover for a full year for hay, seed, pasture or for plowing under during one or more of the five years 1921 to 1925 inclusive.

* These three fields have been in bluegrass pasture for many years before growing corn.

These data showing soil treatments in high and low yielding fields indicate the important place which the use of clover, manure, rock phosphate and limestone have on the farms on which the highest yields of grain were secured as compared with farms where the yields were low.

Notice for example, that approximately one-half of all the high yielding fields of corn, oats and wheat had been covered with rock phosphate while only a very few of the low yielding fields had been phosphated.

The fact that 85 of the 118 high yielding fields had been left in clover sometime during the preceding four years while only 27 of the low yielding fields had had clover left on them shows in a striking way the important place which clover has in securing high crop yields.

Cost of production studies show that good crop yields are essential to profitable farming. During the past five years, cost of production data have been secured on a number of Champaign and Piatt County farms where the type of soil is comparable with that on most of the 225 farms. The cost data show that the cost of growing an acre of corn and other crops remains rather uniform from year to year. The average cost of growing an acre of corn for the five-year period was $29.86 per acre when the land was valued at about $250 per acre and interest on this investment was charged at 5%. With corn at 60¢ a bushel it would require a yield of approximately 50 bushels per acre to pay the cost of production. The cost of growing an acre of other crops in the same area were as follows: winter wheat, $27.76; oats, $22.87; soy beans $29.31; clover hay $21.07; timothy, $20.72; soy bean hay $32.12.

Using current prices for these crops it shows that average yields or better are required to pay the cost of production. Good yields are dependent upon many different factors aside from the fertility of the soil. The influence of some of these factors is indicated in Tables 5, 6 and 7, which show some of the practices followed on the best yielding and poorest yielding fields.

Table 5 - Practices with Seed Corn and Corn Cultivation followed on the Best and Poorest Yielding of 660 fields on Brown Silt Loam Soil. Only fields of ten or more acres were used in this summary.

	Your farm	66 best fields	66 poorest fields
Yield - Bushels per acre		79.3	36.4
Utility type strains		45	14
Yellow other than utility strains		19	41
Other than yellow corn		2	11
Selected before husking		45	40
Selected at husking time		16	12
Selected from crib		1	3
Time unknown or mixed		4	11
Stalks considered in selection		33	31
Stalks not considered		21	18
Not stated or mixed		12	17
Disease or Ear tested		37	27
General test		18	20
Not tested or mixed		11	19
Cultivated with six shovels only		22	10
Cultivated with knives only		29	33
Shovels first time - laid with knives		4	14
Mixed		11	9
Stalks per hill		2.46	2.02
Fields with soy beans		11	6
Fields without soy beans		52	59
Fields partly with soy beans or unknown		3	1
Corn following clover or alfalfa		34	4
Corn following part clover or alfalfa		13	1
Corn following small grain			
Fall plowed - clover		1	5
Fall plowed - no clover		1	20
Spring plowed - sweet clover		1	2
Spring plowed - red clover		2	2
Spring plowed - no clover		1	3
Corn following corn		12	24
Corn following bluegrass		1	0
Corn following mixed crops		0	5

The important place which high yielding types and strains of corn have in actual use is clearly shown in Table 5. Notice that forty-five of the sixty-six high yielding fields of corn were planted with "utility" strains of corn. Contrasted with this, only fourteen of the low yielding fields were of the utility strains. The practical value of disease testing to men on the farm is shown by the larger number of high yielding fields planted with disease tested seed.

The great place which clover has in increasing corn yields is again shown in this table. Notice that 51 of the 66 high yielding corn fields followed more or less clover, while 47 of the 66 low yielding fields followed corn or small grain without clover seeded with it.

Table 6 - Practices with Growing Oats

Treatment and Method of Seeding. On 420 Brown Silt Loam Fields. Only fields of ten or more acres were used in this summary.

	Your farm	42 best fields	42 poorest fields
Yield - Bushels per Acre		58.3	23.9
Iowar, Iowa 103 or Ia. 105		27	19
Silvermine, Big 4, or Great American		14	14
Miscellaneous and Unknown		1	9
Treated in 1925 Treated in 1924		18	10
Treated in 1925 Not treated in 1924		10	12
Not treated in 1925 Treated in 1924		10	6
Not treated in 1925 Not treated in 1924		4	14
Fanned		38	23
Not fanned		4	19
Drilled		3	2
Broadcasted		39	40
Disced - seeded - disced - harrowed		21	25
Seeded - disced - harrowed		16	15
Disced - seeded - harrowed		2	0
Disced only with horses		24	18
Disced only with tractor		14	6
Disced with both or unknown		1	16
Average rate of seeding		3.0 bu.	2.6 bu.

That the use of known high yielding strains of crops is an important cause of the high yields on some farms is again brought out in Table No. 6. Here it is seen that, in spite of an unfavorable year for early oats, standard high yielding strains of early oats were used on 27 of the 42 best yielding of 420 fields. In contrast to this, the same varieties were used on only 19 of the 42 low yielding fields. Notice too that nine of the low yielding fields were on farms where the operators did not know what kind of oats they used.

The value of the old practices of fanning the seed and treating for smut is shown by these data. However, a rather surprisingly large number of farmers do not follow these practices.

Table 7 - Practices with Growing Wheat

Seed Treatment and Methods of Seeding on Best and Poorest of 96 Brown Silt Loam Fields.

	Your farm	10 best fields	10 poorest fields
Yield - Bushels per Acre		33.5	13.3
Turkey Red Type Other than Turkey Red Type		9 1	9 1
Seeded after fly free date Seeded before fly free date		10 0	7 3
Treated for smut Not treated for smut Not stated		4 6 0	2 6 2
Plowed early Plowed late Drilled in corn		7 1 2	6 3 1
Cultivated in Spring Not cultivated in Spring		5 5	3 7
Rate of Seeding		1.52	1.43

The summary of wheat yields shown in Table No. 7 indicates the valuable place which seeding after the fly free date, treatment for smut, and early plowing for wheat have on farms where the largest yields are secured.

The Best Combination of Crops

The profit per acre varies widely with different crops. While good crop yields and low costs are essential, it is equally important that the crops grown shall include a large proportion of the more profitable crops. Cost of production data secured on the cost of producing crops on representative farms in Hancock County for ten years' time show the following average annual profit per acre: corn, $8.59; wheat, $5.44; rye, $4.88; oats, $2.68; clover, $9.32; alfalfa, $12.20; timothy, $3.21; and mixed hay, $ .18 per acre. Cost records kept in Champaign County since 1920 on soil comparable to most of the soil found in the 225 farms included in this report, show similar results regarding the relative profitableness of crops. The net profit has been less per acre largely because of unfavorable prices and wheat was somewhat more profitable than corn because of more favorable prices during recent years.

From such data one might conclude that the best grains to grow in a rotation should consist mainly of corn and wheat on farms where soil and drainage permit growing wheat. Rye has about the same labor requirements as wheat and is a little less profitable though it was generally grown on lower grade land. One should consider in regard to the oat crop that oats usually follow other grain crops and are the last crop before growing a crop of clover. From the standpoint of its place in the rotation, the oat crop may be fairly compared with the third crop of corn. From this point of view, there is good reason to retain oats in the crop rotation. Clover and alfalfa are clearly more profitable than other hays and compare favorably with the grain crops. The gross return per acre may not be as high as from some of our cultivated crops, but the cost of production and the labor expended per acre are usually much less than those required in growing cultivated crops.

From the standpoint of cost of production data and farm practice, the conditions which should be considered in selecting a rotation of crops include the following:

(1) It is generally recognized that a legume crop may well be grown on all plow land once in four or five years. Cost of production data show that these crops are directly profitable in addition to filling the need which exists on most farms in building up the soil.

(2) Crops differ as to the time of year they require labor. Oats are seeded ahead of corn planting and are cut after corn cultivation is completed. Wheat harvest, ground preparation, and seeding follow corn cultivation and precede corn picking. These three crops fit together well in giving a good distribution of labor. Alfalfa requires labor at a time that usually interferes somewhat with each of these grain crops but considered on the acre basis it is usually a more profitable crop than any of them where the soil has been well-drained and well-limed. Cost records during the past three years show a net profit of over $20.00 per acre when the hay was valued at $15.00 to $18.00 per ton. During the same period grain crops have shown very little profit.

(3) A succession of cultivated crops, small grain crops and legumes is practically essential in a good rotation in order to control weeds, plant diseases and insects, and to provide for a succession of deep and shallow rooted crops, as well as to maintain or improve the soil.

(4) Crops may be selected to some extent with reference to the needs of feeding the livestock kept on the farm. More generally livestock production plans are adapted to the cropping plan as it is affected by the proportion of tillable land and the condition of the soil.

A consideration of the profitableness of the different crops and the other factors mentioned, as well as a study of the earnings on many central Illinois farms, over a period of years, leads to the conclusion that the most profitable cropping system should contain 60% to 70% of the more profitable crops, which in this section are corn, wheat and alfalfa. The experience of many farmers who are located near a canning factory is that sweet corn is likewise satisfactory as a profit crop. It is probable that from the standpoint of labor distribution and the cost of operating the entire farm that not more than 40% of the crop land should be planted to one crop in central Illinois.

(Annual data regarding the cost of producing crops and livestock in east central Illinois are available on request to the Department of Farm Organization and Management of the University of Illinois).

The Place of Livestock on Farms in Central Illinois

The farmer in central Illinois has more opportunity of choosing whether he will sell his crops directly or sell them in the form of livestock and livestock products than farmers in many parts of the country. Cost of production studies show that the average farmer one year with another makes more profit in feeding livestock than in selling crops directly. This means that the man who is especially successful with livestock has the opportunity of greatly increasing his profit by feeding his crops. In addition, livestock production helps maintain the fertility of the soil.

There is a wide variation in the returns which different farmers get for the feed fed to livestock. Special emphasis can well be placed on the cost of feed in livestock production since feed makes up from 40% to 85% of the total cost of producing or keeping different classes of livestock. One of the largest problems of the corn belt farmer is to find how he can utilize legumes, non-salable roughage and low grade grains to best advantage. Recognizing this problem, one is led to the conclusion that all corn belt farms have a place for some livestock capable of utilizing rough feeds. Legumes are grown primarily to improve the soil hence they should not be sold from the farm. A man has the alternative of turning the legume under or utilizing it with livestock. There is good reason to believe that the man who gets some direct return from the legume through livestock receives the larger profit in the long run. When no livestock is kept there is a temptation to sell legume crops from the farm. There is also considerable aftermath in stubble fields, or meadows and other roughage which has no sale value but which can be converted into profit by livestock. Frequently, there is low grade grain which can be fed to better advantage than can be gained by its sale.

In the effort to utilize legumes and less-salable feeds on the farms the error should not be made of feeding too heavily on salable grain. The return for $100 worth of feed fed on the farms included in this project shows conclusively that many men are not feeding their stock economically. It is believed that this is one of the sources of large losses on corn belt farms.

The profit in livestock production is dependent also on management practices other than feeding. A special study on the cost of producing pork in McLean and Woodford Counties conducted by the College of Agriculture and the United States Department of Agriculture helps to illustrate this statement. Results on 25 of these farms in 1924 show that 8 of these farms following the McLean County system of sanitation produced 100 pounds of pork with an average of 102 pounds less grain than 8 other farms, paying little attention to sanitation. As a result of differences in management and feeding practice, it was found that 4 farms produced pork at a cost of less than $8.00; 9 farms between $8.00 and $9.00; 5 farms between $9.00 and $10.00; 4 farms between $10.00 and $11.00, and 3 farms above $12.00 per hundred pounds. With hogs selling at $8.00 per hundred, 16% of these farms would still have made some profit. Similar comparisons might be made on other classes of livestock from the available data which would serve only to emphasize the facts already stated.

The Use of Man Labor and Farm Power

Cost of production records show that man labor and horse and tractor power are the largest items of operating cost in growing crops. While there is less opportunity of reducing man labor costs than farm power costs, some men through good management accomplish much more than otherswith a given amount of labor. The cost of horse labor frequently is not appreciated because the horses are fed from crops grown on the farm and the cost of horse labor is realized mainly in a reduction of the amount of crops that remain to be sold.

As to horse power costs, 1924 cost data from 32 farms in central Illinois showed a variation in cost of keeping one horse for a year from $79.00 to $158.00 with an average of $115.00. There was also a wide variation in hours of horse labor done on these farms, the average being less than 800 hours per horse for the year. The resulting cost per hour of horse labor varied from 9 cents to 25 cents with an average of 15 cents on these farms, leaving out one small farm with a cost of over 37 cents.

The average cost of operating 68 two-plow tractors in Champaign County in 1925 was $238. These tractors were used an average of 300 hours, giving an average hourly cost of 79 cents. The average annual cost for 33 three-plow tractors in the same area was $328.54 or an average of $1.39 for each of the 237 hours of use.

Size of Farms

The farms included in this project vary from 40 to 640 acres in size. The farms were divided into six different size groups as shown in Table 8. The type of soil is similar on most of the farms but it happened that there were a greater number of farms from 141 to 180 acres in size that were on sandy or lighter soil than in the other size groups. This is reflected slightly in the value of land per acre. It is probable that farms on poorer land were more greatly affected by the dry season of 1925.

The average investment for the different groups varied from about $32,000 to over $100,000 per farm. It is remarkable that the rate of interest earned on the investment for the different groups fell between 3.02% and 3.9% for all the groups except the second, which, as mentioned, was more affected by adverse soil and weather conditions. This difference in type of soil was

responsible for other differences in this group of farms, such as the amount of livestock kept. The labor and management wage was highest on the small farms and with the exception of group 2, continued to decrease as the farms became larger. This is to be expected in a year when farm earnings were as low as they were in 1925.

Similar studies of size of farms show that normally the smaller farms make a larger rate on the investment than do the larger farms. In this study it was found that crop yields on the whole were larger on the small farms. Also it will be noted that the investment in livestock and the returns from livestock were larger per acre on the small farms. One concludes from such data that the quality of work on the smaller farms is usually better and that frequently livestock helps to increase the size of the business.

There are some disadvantages of the smaller size farms which are clearly brought out in this data. The number of acres of crops worked with one man and one horse gradually increase with the larger size farm. Also the expense per acre for farm improvements, machinery and equipment, the value of all labor, and other expenses are higher on the small size farms and gradually decrease as the acreage increases. This is to be expected since many of the farm improvements and much of the machinery and equipment have to be provided even with a small acreage and the cost is not increased proportionately as the size of the farm increases.

Since the expenses per acre are necessarily higher on the small size farm, there is good reason for the smaller size farm to use land more intensively and to choose enterprises which will help to increase the size of the business. This has been accomplished to some extent through securing larger crop yields and through keeping a larger amount of livestock per acre. Noting, however, the smallpercent of legumes on all the farms, it is probable that the smaller farms might well increase the percent of land in such crops as alfalfa and give special attention to having a large percent of the land in crops which will give the largest return per acre. Dairying and poultry production are enterprises well adapted to the small sized farm, since they require large amounts of labor and require less feed for the income received than do other classes of livestock. Frequently, there is opportunity of introducing truck crops in the locality of canning plants or the larger towns which may serve well in making small farms more profitable.

While pointing out the disadvantages of farms which are relatively small, one should not overlook the fact that frequently the reason why many of the larger farms are not more profitable is because they do not approach the same organization of the smaller farms. It will be noted that the larger farms tend to grow a larger percent of the land in corn and oats and have a smaller percentage of the land in legumes than do the smaller farms. Also the investment in livestock and the returns per livestock amounted to only about half as much as on the smallsized farms. Occasionally larger farms go to the extreme in handling a large acreage per man and per horse, and as a result receive smaller yields.

The disadvantages of either the small or the large farms serve merely to emphasize some of the things to which every farmer should give attention in working out the plan or organization of his farm and the practices he follows in the operation of his farm.

Table 8. - SIZE OF FARM IN RELATION TO FARM ORGANIZATION AND OPERATION

	Your farm	Farms of 40-140 acres	Farms of 141-180 acres	Farms of 181-220 acres	Farms of 221-260 acres	Farms of 261-320 acres	Farms of 321-640 acres
Number of farms		33	47	34	41	43	27
Average size of farm		118.9	161.8	204.8	240.4	298.2	408.4
Value of land per acre		$ 194.68	$ 188.11	$ 193.56	$ 192.76	$ 189.18	$ 193.26
Total investment per acre		$ 274.06	$ 254.16	$ 263.77	$ 261.52	$ 250.96	$ 257.07
Rate earned on investment		3.61%	2.48%	3.90%	3.19%	3.29%	3.02%
Labor and management wage		$ 194.50	$-339.25	$ 106.25	$-424.64	$-587.56	$-1382.71
Gross receipts per acre		$ 28.12	$ 22.09	$ 25.56	$ 22.95	$ 22.05	$ 21.74
Total expense per acre		$ 18.23	$ 15.79	$ 15.28	$ 14.61	$ 13.80	$ 13.97
Net receipts per acre		$ 9.89	$ 6.30	$ 10.28	$ 8.34	$ 8.25	$ 7.77
Percent of farm tillable		91.0%	89.7%	88.2%	90.1%	88.9%	90.8%
Percent of tillable land in							
Corn		43.2%	43.5%	44.2%	45.9%	42.7%	46.1%
Oats		24.3%	25.7%	28.6%	25.8%	25.1%	26.7%
Wheat		5.5%	7.2%	5.5%	6.8%	10.1%	5.2%
Legumes		19.6%	17.2%	15.1%	14.8%	13.6%	13.7%
Blue grass		3.7%	3.3%	2.9%	3.2%	4.0%	6.1%
Timothy		.6%	.8%	1.2%	1.8%	3.0%	.7%
Miscellaneous		3.1%	2.2%	2.5%	1.8%	1.5%	1.5%
Percent of income from livestock		69.4%	57.6%	66.9%	60.5%	55.5%	47.8%
Investment in productive L.S. per A.		$ 15.25	$ 9.44	$ 13.51	$ 9.42	$ 8.94	$ 7.98
Livestock returns per acre		$ 19.26	$ 12.55	$ 16.95	$ 13.74	$ 12.09	$ 10.37
Pounds of pork per acre		91.8	59.6	91.0	77.7	59.3	46.7
Crop acres per man		73.5A.	81.1A.	83.7A.	94.0A.	93.5A.	101.8A.
Crop acres per horse		18.0A.	19.9A.	21.9A.	25.5A.	24.0A.	28.0A.
Expense per $100 gross income		$ 64.83	$ 71.48	$ 59.79	$ 63.66	$ 62.58	$ 64.26
Expense per acre of whole farm							
Farm improvements		$ 1.19	$ 1.01	$ .99	$ 1.20	$ .93	$ 1.14
Machinery and equipment		$ 2.49	$ 2.27	$ 2.34	$ 2.29	$ 2.01	$ 2.16
Hired and home labor		$ 8.14	$ 7.39	$ 7.13	$ 6.82	$ 6.51	$ 6.28
Other expenses		$ 6.41	$ 5.12	$ 4.83	$ 4.29	$ 4.35	$ 4.39
Farm produce used in home		$ 353.98	$ 406.98	$ 450.83	$ 443.67	$ 487.11	$ 423.18
House rent (10% of value)		$ 356.61	$ 353.00	$ 515.06	$ 462.80	$ 441.59	$ 621.74
Total living furnished by farm		$ 710.59	$ 759.98	$ 965.89	$ 906.47	$ 928.70	$ 1044.92

ORGANIZATION AND PURPOSE OF THE FARM BUREAU-

FARM MANAGEMENT SERVICE PROJECT

The Farm Bureau Farm Management Service Project was organized during the latter part of the year 1924. Its purpose is to assist the farmers cooperating in it to keep such farm accounts as will enable them to study the efficiency with which they are conducting their farm business and to help them to apply to their individual farms the practices in farm organization and operation which have proven profitable on other farms of a similar type. The project in which 239 farmers cooperated is an outgrowth of the regular Extension Project in Farm Organization and Management of the College of Agriculture of the University of Illinois.

The cooperators in the project are farm bureau members of Livingston, McLean, Tazewell and Woodford counties. Farm accounting work of the Illinois Extension Service was started in Tazewell county in 1915 and taken up in Woodford county in 1916. A little work was also done in Livingston and McLean counties in 1916. In Woodford county where more work has been done than in the other counties, from thirty to one hundred farmers kept the records each of the nine years from 1916 to 1924 inclusive. Beginning with 1921, one hundred records have been closed each year.

During each of the last six years, Farm Management tours have been conducted; each tour included visits to six or eight of the more profitable farms which showed the effects of good practices. During these tours the cooperators had the opportunity to learn from efficient farmers how they might improve the organization and operation of their own farms. The results of the work are clearly shown in the increased efficiency with which many of the farms are being operated as shown by their consecutive annual records over the past ten years.

The growing number of farmers keeping records made it impossible for the College of Agriculture to give as much assistance to each cooperator as was desired and the demand in Woodford county required considerable time which the farm adviser needed for other work. The farmers cooperating in this work felt they wanted more rather than less assistance with it.

This was the situation that lead to the organization of the Farm Bureau Farm Management Service in which 239 farmers about equally distributed, in Livingston, McLean, Tazewell and Woodford counties are cooperating. The University of Illinois cooperated with the farm bureaus in the four counties in organizing the project.

Plan of Organization

About sixty farm bureau members in each of the four counties have agreed to cooperate in the project for the three years of 1925, 1926 and 1927. The total average cost is about twenty-five dollars per farm per year. One-third of the expense is borne by the University of Illinois. This leaves a cost per farm of about seventeen dollars per year. The fee per farm varies from ten to twenty dollars per year depending on the size of the farm. In two of the counties, the Farm Bureaus pay a portion of each fee, while in two counties the cooperators pay the entire fee of ten to twenty dollars.

The work is under the direction of H. C. M. Case, in charge of the Department of Farm Organization and Management acting jointly with an advisory committee consisting of one representative of each farm bureau. This committee consists of G. F. Bennett, Livingston County, Chairman, E. D. Lawrence, McLean County, W. C. Somer, Tazewell County, and J. Frank Felter, Woodford County, who is secretary-treasurer. This committee is responsible to the cooperating farm bureaus for the custody and expenditure of the funds raised by the collection of the cooperators' fees. Each Farm Bureau collects the fees from its cooperating members and pays them over to the committee.

The organization of the project was made possible by the hearty support and assistance of the four Farm Advisers and their assistants. The Farm Advisers who were in charge of their counties when the work was organized are H. O. Allison, Livingston County, H. Fahrnkopf, McLean County, Ralph E. Arnett, Tazewell County, and P. E. Johnston, Woodford County. Mr. Johnston left the county in January 1925 to specialize in Farm Management and H. A. deWerff, the present Farm Adviser, has cooperated since the work was started.

The entire time of M. L. Mosher, one of the authors of this report, is given to the project. Each cooperator was visited on his farm at least three times during the year 1925. Whenever possible, the Farm Advisers will accompany him while returning these reports to the cooperators. This will be done during May.

A Farm Management tour was conducted in September, 1925 to six of the farms where similar work had been under way for three or more years. Such tours will be conducted each year visiting profitable farms in each county which will enable the cooperators to learn what practices are followed by the farmers whose farms are organized and operated most efficiently.

SECOND ANNUAL REPORT

For the Cooperators in the
Farm Bureau-Farm Management Service
For the Year 1926

Prepared by M. L. Mosher, and H. C. M. Case

An average of 2.8 percent on the entire farm investment, after deducting all expenses and $720 allowance for the value of the operator's labor, was made by the 210 farmers who are cooperators in the Farm Bureau-Farm Management Service and whose records were used in preparing this report. The average investment in land, buildings, livestock, and other equipment was $255.93 per acre with land valued at $192.24. Expressing the earnings in another way, these men after paying all expenses of operating their farms and allowing 5 percent interest charge on the investment lacked $616 of getting any return for their own labor.

In addition to the above earnings each family secured produce from the farm which, based on records kept on 181 farms, amounted to $466.70 at farm prices. Also the house they lived in was worth $470.35 per farm each year, based on depreciation, upkeep, and interest charges. The total value of these two items amounted to $937.05 at farm prices.

The income figures given in this report should not be considered as representative of all farms in these counties. A survey study of all farms in one township in McLean County in 1925 in about the center of the four counties included in this project, and a similar study of farm incomes in a township in Bond County in 1926 indicate that the farms on which the records were kept in this project earned about 2 percent higher rate on the investment than the average of all farms in the same part of the state.

Differences in Earnings Between Farms

There are wide variations in the earnings on the most successful and the least successful farms. The 42 most profitable of the 210 farms made 5 percent interest on the investment and had $1,410 to pay the operator for his own labor and management while the 42 least profitable farms lacked $2,311 of making 5 percent on the investment, and left nothing to the operator for his own labor and management.

This amounts to a total difference of $3,710 in the return for the labor and management of the operators between the high and low groups of farms. This may be expressed in another way by saying, after all expenses were paid and the operator allowed $720 for his own labor, the most profitable group made 6.28 percent on the investment, while the least profitable group lacked .01 of 1 percent of getting any return for the money invested.

What Accounted for the Difference in Farm Earnings

The one-fifth most profitable farms (42 farms) had an income of $29.59 an acre, while the one-fifth least profitable farms had an income of only $14.74 per acre (see Table 2). The total expenses per acre on the two groups of farms were $13.71 and $14.77 per acre respectively. In other words, the most profitable group of farms with $1.06 less expense per acre received two times as large returns per acre. The same table shows that the least profitable farms were a little larger in size on the average and that they had a little larger investment per acre due mainly to a larger investment in farm improvements.

Factors Affecting Farm Income

Crop yields. The yields per acre on the most profitable farms were as follows: Corn 55.8; oats 43.5; wheat 25.5 bushels. On the least profitable group the yields were: Corn 47; oats 35.6; and wheat 18.3 bushels. The difference in the yield of corn, wheat, and oats shown between the most profitable and the least profitable groups of farms, when applied to the acreage of these crops grown on the average of all farms, would amount to a difference of $869.28 with corn valued at 60 cents, oats 35 cents, and wheat $1.25 per bushel. The effect of yields on the farm income is greater than is indicated by this figure if the comparison had been worked out for all the other crops grown.

Kinds of crops grown. The most profitable group of farms grew a larger acreage of corn, wheat, alfalfa, sweet clover, red clover, and canning crops, but a smaller acreage of oats, bluegrass, timothy, and other crops. The most profitable group of farms grew a larger proportion of the more profitable crops, as discussed later. The difference in the proportion of land in corn, oats, and wheat shown between the most profitable and the least profitable groups of farms when applied to the average size farm would account for a difference of $412.49 with the crops valued at the same prices given above.

The amount and efficiency of livestock. The most profitable group of farms with an investment of $12.04 an acre in productive livestock received a livestock return of $19.07 per acre, while the least profitable group of farms had $9.04 invested and received a return of $10.10 per acre. Also the most profitable group of farms received $185.09 returns for each $100 worth of feed fed compared with a return of $129.95 for the least profitable group. The return for $100 worth of feed fed was greater for beef cattle, mixed cattle, dairy cattle, hogs, sheep, and poultry on the most profitable farms. The difference in the return for $100 worth of feed fed between the most profitable and the least profitable farms amounted to a difference of $1,049.44 with the amount of $1,903.23 worth of feed fed on the average farm. This does not include the difference in cost of keeping horses on the two groups of farms.

Use of man labor. The most profitable group of farms had the same man labor expense ($6.87) per acre as the least profitable group ($6.86). This is significant when one recognizes that the returns were twice as high on the most profitable farms.

Power and machinery costs. The total cost of horse and tractor power and machinery cost per acre on the most profitable farms amounted to only $4.24 per acre compared with a cost of $4.96 per acre on the least profitable farms. This difference in cost of power and machinery of 72 cents per acre would amount to a difference of $167 less cost per farm in favor of the most profitable farms.

Relation of expense to income. The most profitable farms had a total expense of $46.32 for every $100 taken in compared with the expense of $100.17 on the least profitable farms. These expenses did not include interest on the investment in the farm business. As shown in the previous discussion, this difference is due largely to the larger income per acre on the most profitable farms. It illustrates, however, the necessity of keeping the right relationship between expenses and income. Many farms with a good income failed to make a good profit because of large expenses.

Table 1. SUMMARY OF THE YEAR'S FARM BUSINESS

Your summary as shown on pages 34 and 35 of your book compared with 210 farms, the forty-two most profitable and the forty-two least profitable farms.

	Items	Your farm	Average of 210 farms	42 most profitable farms	42 least profitable farms
1	Capital Investments - Total	$_____	$59,403	$55,390	$59,701
2	Land		44,620	42,230	43,770
3	Farm improvements		5,840	4,637	7,055
4	Machinery and equipment		1,883	1,699	2,004
5	Feed, grain and supplies		3,809	3,393	3,917
6	Livestock - Total		3,251	3,431	2,955
7	Horses		820	707	845
8	Cattle		1,131	1,032	967
9	Hogs		931	1,261	855
10	Sheep		203	243	151
11	Poultry		152	142	123
12	Bees		14	46	14
13	Receipts and Net Increases - Total	$_____	$ 4,813	$ 6,483	$ 3,383
14	Farm improvements		---	---	---
15	Feed, grain and supplies		1,961	2,457	1,339
16	Labor off the farm		63	106	44
17	Miscellaneous		6	6	7
18	Livestock - Total		2,783	3,914	1,993
19	Horses		--	33	--
20	Cattle		454	467	418
21	Hogs		1,689	2,669	1,182
22	Sheep		32	41	--
23	Poultry		121	115	97
24	Egg sales		130	141	87
25	Dairy sales		353	427	208
26	Bees		4	21	1
27	Expenses and Net Decreases - Total	$_____	$ 2,234	$ 2,127	$ 2,520
28	Farm improvements		259	201	347
29	Machinery and equipment		481	474	549
30	Feed, grain and supplies		---	---	---
31	Miscellaneous livestock expense		52	61	61
32	Miscellaneous crop expense		250	254	258
33	Hired labor		634	630	704
34	Taxes, insurance, etc.		500	460	518
35	Miscellaneous expenses		50	47	61
36	Horses - decreases		8	--	22
37	Miscellaneous livestock decreases		--	--	--
38	Receipts less expenses	$_____	$ 2,579	$ 4,356	$ 863
39	Operator's and family labor		914	876	869
40	Net income from investment		1,665	3,480	- 6

Table 2 - IMPORTANT FACTORS BY WHICH THE FARM BUSINESS MAY BE STUDIED
Underlined factors are the ones used on the chart, Page 6

Item	Your farm	Average of 210 farms	42 most profitable high farms	42 least profitable low farms
Rate earned on investment	____%	2.80%	6.28%	- 0.01%
Labor and management wage	$	$-616.	$1,410.	$-2,311.
Gross receipts per acre	____	20.74	29.59	14.74
Total expense per acre		13.57	13.71	14.77
Net receipts per acre		7.17	15.88	- .03
Size of farm	____	232.1	219.1	229.4
Total investments per acre	$	$ 255.93	$ 252.80	$ 260.28
Land		192.24	192.74	190.83
Farm improvements		25.16	21.16	30.76
Machinery and equipment		8.11	7.75	8.74
Feed, grain and supplies		16.41	15.49	17.07
Horses		3.53	3.23	3.68
Productive livestock		10.48	12.43	9.20
Corn - Bushels per acre	____	51.3	55.8	47.0
Oats - Bushels per acre		37.1	43.5	35.6
Wheat - Bushels per acre		20.6	25.5	18.3
Hay - Tons per acre		1.3	1.4	1.3
Percent of farm tillable		90.3	90.0	91.4
Percent of tillable land in				
Higher profit crops	____	60.1	66.8	55.7
Corn		45.6	48.3	42.8
Wheat		7.0	10.2	7.3
Alfalfa		2.7	2.1	2.0
Sweet clover		3.7	4.6	3.6
Canning crops		1.1	1.6	0.0
Medium profit crops		7.4	6.1	8.3
Clover		1.7	1.5	1.4
Clover and timothy mixed		3.2	2.1	4.1
Barley, soybeans, etc.		2.5	2.5	2.8
Low profit crops		32.5	27.1	36.0
Oats		25.5	22.1	25.8
Timothy		2.8	2.6	3.3
Bluegrass		4.2	2.4	6.9
All legumes		12.8	12.2	12.7
All grain and hay crops		88.6	90.9	85.1

Table 2 - (Continued)

Item	Your farm	Average of 210 farms	42 most profitable farms	42 least profitable farms
Productive livestock				
Investment per acre	$_____	$ 10.43	$ 12.04	$ 9.04
Returns per acre		13.38	19.07	10.10
Value of feed fed to all productive livestock		1,903.23	2,321.00	1,857.72
Returns per $100 feed fed to				
All productive livestock		159.70	185.09	129.95
Beef cattle	_____	84.84	135.81	53.29
Mixed cattle	_____	108.54	121.45	100.54
Dairy cattle	_____	137.61	153.74	108.09
Hogs	_____	196.41	206.10	179.96
Sheep	_____	47.00	120.75	- 5.89
Poultry		280.03	302.73	261.66
Pounds of pork produced		14,848	22,563	10,598
Feed cost per 100 pounds of pork		$ 6.10	$ 5.90	$ 6.77
Returns per 100 pounds of pork		11.96	12.20	11.96
Pounds of pork per acre		64.0	103.0	46.2
Returns per $100 invested in poultry	_____	$ 207.11	$ 226.43	$ 202.48
Average number of hens kept		107.0	100.9	104.3
Number of eggs per hen		85.4	96.7	78.0
Labor and power				
Percent of farms with tractors		65.2	71.4	66.7
Percent of farms with trucks		29.5	21.4	33.3
Percent with tractors and trucks		24.8	19.0	28.6
Percent without tractors or trucks		30.0	26.2	28.6
Crop acres per man		92.5	90.6	89.6
Crop acres per horse		24.7	26.6	23.4
Hired and home labor per acre of farm		$ 6.67	$ 6.87	$ 6.86
Horse feed and depreciation per acre of farm		2.35	2.08	2.57
Machinery cost per acre of farm		2.07	2.16	2.39
Horse and machinery cost per acre		4.42	4.24	4.96
Expenses per $100 gross income	$_____	$ 65.40	$ 46.32	$ 100.17
Expenses per acre of whole farm		13.57	13.71	14.77
Farm improvements		1.12	.92	1.51
Horses		.03	--	.10
Machinery and equipment		2.07	2.16	2.39
Feed, grain and supplies		----	----	----
Miscellaneous livestock expense		.22	.28	.27
Miscellaneous crop expense		1.08	1.16	1.12
Hired and home labor		6.67	6.87	6.86
Taxes, insurance, etc.		2.16	2.10	2.26
Miscellaneous expenses		.22	.22	.26
Family living furnished by 181 farms				
Farm produce used in home		$ 466.70	$ 450.72	$ 481.94
House rent (10 percent of value)		470.35	457.64	502.21
Total living furnished by farm		937.05	908.36	984.15
Size of family		5.0	4.8	5.0

Table 3 - FIND YOUR FARM LEAKS

The numbers above the double line across the middle of the page are the averages for the 210 farms used in this summary of the factors named at the tops of the columns. By drawing a line across each column at the number measuring the efficiency of your farm as shown in Table 2, you can compare your efficiency with that of the other farms in the project.

Rate earned on invest-ment	Bushels per acre			Per-cent land in high prof-it crops	Livestock returns per $100 feed				In-vest-ment in L.S. per acre	Size of farm	Percent efficiency		Ex-pense per $100 gross in-come	Gross income per acre
	Corn	Oats	Wheat		Cat-tle	Hogs	Sheep	(1) Hens			Man lab-or	Horse and ma-chin-ery		
10.8	91	77	53	100		276	207	367	26	552	180	180	25	45
9.8	86	72	49	95		266	187	347	24	512	170	170	30	42
8.8	81	67	45	90		256	167	327	22	472	160	160	35	39
7.8	76	62	41	85		246	147	307	20	432	150	150	40	36
6.8	71	57	37	80		236	127	287	18	392	140	140	45	33
5.8	66	52	33	75		226	107	267	16	352	130	130	50	30
4.8	61	47	29	70		216	87	247	14	312	120	120	55	27
3.8	56	42	25	65		206	67	227	12	272	110	110	60	24
2.8	51	37	21	60		196	47	207	10	232	100	100	65	21
1.8	46	32	17	55		186	27	187	8	192	90	90	70	18
.8	41	27	13	50		176	7	167	6	152	80	80	75	15
- .2	36	22	9	45		166	-13	147	4	112	70	70	80	12
-1.2	31	17	5	40		156	-33	127	2	72	60	60	85	9
-2.2	26	12	1	35		146	-53	107	0	32	50	50	90	6
-3.2	21	7	--	30		136	-73	87	-	-	40	40	95	3

(1) Returns per $100 invested used for poultry.

Profitable Farming Requires Balanced Farming

Weaknesses in some parts of the farm business often offset the advantages gained at other points. In an efficiency study of an ordinary corn-belt farm the more important points to be considered, most of which are well illustrated in the data in this report, include the following:

1. Crop yields
2. Kinds of crops grown
3. Efficiency with which livestock is produced
4. Use of man labor
5. Use of horse labor and farm power
6. Relationship of expenses to receipts

Two other factors which are important in some areas but not used in the analysis on this page are "amount of livestock" and "size of farm."

In Chart 1 is shown the value of doing at least fairly well in each line of farm work. Farms on which complete records were kept in 1925 were divided into seven groups according to the number of the six factors named above in which each farm did more efficient work than the average of all the farms studied.

Chart 1 - Relation of Rate Earned on the Total Farm Investment to the Number of Factors in Which Farms Excel. Data from 1925 Records.

Number of factors in which farms excel	Number of farms	Your farm	The lengths of the shaded lines are in proportion to the average rates earned on the total farm investments.	Rate earned	Average net income
0	7		XXXX	.9	$ 539
1	30		XXXXXX	1.1	659
2	44		XXXXXXXXXXXX	2.4	1,437
3	57		XXXXXXXXXXXXXXX	3.0	1,797
4	42		XXXXXXXXXXXXXXXXXXXXXXX	4.9	2,935
5	27		XXXXXXXXXXXXXXXXXXXXXXXX	4.9	2,935
6	7		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	7.6	4,552

It may well be noted that those few farms which were doing better than the average along all six lines of farm work earned 7.6 percent on their total farm investments, while those which were below the average in all factors earned only .9 percent. Applied to the average farm investment, this meant a difference of over $4,000. With considerable regularity, the rates earned on the seven groups of farms increased as the number of factors in which the farms excelled increased.

Each operator may well study this report, first, to determine how his efficiency compares with the average in each particular; and, second, to learn the methods used on those farms which are operated more efficiently in each factor. Each of the above factors is discussed briefly on the following pages.

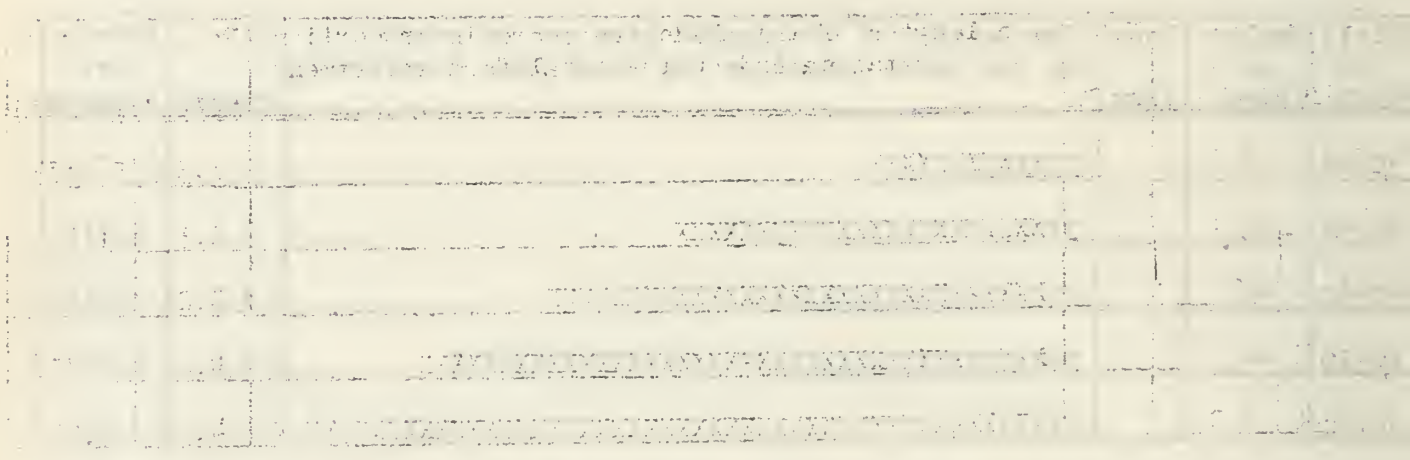
Crop Yields

Good crop yields are, as a general rule, essential for good net farm incomes. Chart 2 shows the relation found in 1925 between the yields of corn on the farms of the cooperators and the rates earned on the total farm investments. It should be understood that not all of the indicated increase of net income on the farms having higher yields of corn is due to the increased corn yield. The tendency is for the same farms which have good corn yields to have good yields of other crops, larger proportions of tillable land in the higher profit crops, and to have higher returns for feed fed to livestock.

Chart 2 - Rate Earned as Related to the Yield of Corn

The rates earned on the different groups of farms were affected more or less by other factors such as percent of land in higher profit crops and efficiency in feeding livestock.

Yield of corn	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned on the total farm investments	Rate earned	Average net incomes
30-40	8		XXXXXXXXXXX	1.3	$ 779
40-50	51		XXXXXXXXXXXXXXXXXXXXXX	2.3	1,377
50-60	94		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.2	1,916
60-70	55		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.0	2,396
70-80	9		XXXXXXXXXXXXXXXXXXXX



Crop Yields (Continued)

The data given in Chart 3 are only for fields of ten acres or larger planted on the brown silt loam and black clay loam soil types. It may well be noted that, for the cooperators in this project, the use of high yielding, utility strains of seed corn added seven to eight bushels per acre and that the ear testing of seed added from two and one-half to four bushels. Clover used in the rotation added about seven bushels, manure added about eight bushels, and rock phosphate increased the yield from six to eight bushels.

The twenty-nine fields planted with tested, utility seed on soil which had had rock phosphate in addition to clover or manure yielded an average of thirty bushels more than seventeen fields planted with untested, old type corn on land which had had no phosphate and had not had any manure nor clover left stand for at least four years.

Chart 3 - Corn Yields as Related to Seed Practices and Soil Treatments - 1925 data

Practice or treatment	Number of fields	The lengths of the shaded bars are in proportion to the yields secured from fields treated as indicated	Bushels per acre
Yields as related to seed practices			
Old type untested	30		49.9
Old type ear tested	131		53.9
Utility untested	30		58.3
Utility ear tested	133		60.8
Yields as related to soil treatments			
None	76		46.7
Manure	43		53.3
Clover	54		54.7
Manure - clover	56		58.7
Manure - rock phos.	6		60.6
Clover - rock phos.	24		60.9
Man.-clo. rock phos.	35		66.4
Yields as related to seed practices and soil treatments			
Both poor	17		42.3
Both good	29		72.5

Value of Growing Profitable Kinds of Crops

It often happens that a farm which has good crop yields and where efficient work with livestock is done is relatively unprofitable because a large part of the tillable land is used in growing crops which do not give as good returns for the land, labor, power, and machinery as do other crops which might be grown.

Chart 3 shows the relation of the rates earned on these farms and the percent of tillable land in the combined acreage of the higher profit crops of corn, wheat, alfalfa, sweet clover and canning crops of sweet corn, peas, and pumpkin. The selection of corn and wheat as the higher profit grain crops, of alfalfa as the higher profit hay crop, and of sweet clover as the higher profit pasture crop for tillable land was based on long-time investigations of the Departments of Farm Organization and Management and Animal Husbandry of the University of Illinois.

Chart 3 - Rate Earned as Related to the Percent of Land in the Higher Profit Crops

It should be understood that part of the increased net income was due to better crop yields, better handled livestock, etc., on the same farms. Data is from 1925 records.

Percent land in higher profit crops	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned on the total farm investments	Rate earned	Average net income
30 - 40	8		XXXXXXXXXXX	1.4	$ 838
40 - 50	35		XXXXXXXXXXXXXXXXXXXX	2.5	1,497
50 - 60	82		XXXXXXXXXXXXXXXXXXXXX	2.9	1,737
60 - 70	65		XXXXXXXXXXXXXXXXXXXXXXXXX	3.5	2,096
70 - 80	25		XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.1	2,455
80 - 90	9		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	5.8	3,474

It will be noted in Table 2 that 48.3 percent of the tillable land on the 42 most profitable farms was in corn. It is doubtful if it is ever wise to have more than fifty percent of the tillable land in corn or any other one crop, because of the uneven distribution of labor, difficulty of maintaining soil fertility, difficulty of controlling weeds and insects and the risk of storms or other uncontrolable conditions which may seriously injure one crop but do little damage to others.

It is apparent that those cooperators who are farming most profitably are, in most cases, men who have almost done away with timothy and blue-grass on tillable land and have reduced the acreage of oats.

Relation of Amount and Efficiency of Livestock to Farm Incomes

Efficient care and feeding of livestock is essential for the best net farm incomes. Those farms having a small amount of livestock well handled had larger net incomes than farms having large amounts of livestock poorly handled. With the present favorable prices of livestock in relation to prices of grain the farms which fed most of their grain to well handled livestock had net incomes about $2,000 higher than farms having small amounts of livestock poorly handled.

Chart 4 - Relation of the Rate Earned and the Amount and Efficiency of Livestock

It should be understood that the rates earned were affected also by the crop yields, percent of land in higher profit crops, etc., - 1925 data.

Returns for $100 feed	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned by the different groups of farms.	Rate earned	Average net income
Less than $6.00 invested in productive livestock per acre - $4.00 average					
$100-150	21		XXXXXXXXXXX	1.7	$1,018
$150-200	29		XXXXXXXXXXXXXXXXXXX	3.1	1,857
$200-250	8		XXXXXXXXXXXXXXXXXXXXXX	3.4	2,036
From $6.00 to $11.00 invested in productive livestock per acre - $8.25 average					
$100-150	26		XXXXXXXXXXXXXX	2.2	$1,318
$150-200	31		XXXXXXXXXXXXXXXXXXXXXXXX	3.7	2,216
$200-250	6		XXXXXXXXXXXXXXXXXXXXXXXXX	4.1	2,455
More than $11.00 invested in productive livestock per acre - $18.50 average					
$100-150	29		XXXXXXXXXXXXXXXXXX	3.1	$1,857
$150-200	27		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	5.2	3,114
$200-250	6		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	6.0	3,593

Those farms in the first three groups which had an average of only four dollars per acre invested in productive livestock sold a large portion of their crops while those in the last three groups which had an average of $18.50 per acre invested in livestock fed most of their grain.

A few of the more important things the cooperators do to get high returns for feed fed to livestock are:

1. Use the best types of breeding stock.
2. Study market conditions carefully as a guide to the purchase and sale of cattle, sheep, and hogs.
3. Follow proved plans for keeping livestock healthy, such as the McLean County System of Swine Sanitation and the growing of chicks on clean ground.
4. Use rotated legume pastures which provide clean feeding grounds and the necessary protein and minerals in the rations.
5. Grow their own feeds, especially legumes, for the proper feeding of livestock.
6. Purchase sufficient unmixed high protein products, such as tankage, oil meal, and cottonseed meal to balance the home-grown feeds.

Efficiency in the Use of Man Labor and Horse Power and Machinery

While the efficient use of man labor and of horse power and machinery are important as they affect the net farm incomes, no divisions of the farms into groups according to such efficiencies have yet been made. In Table 2, page 4, it is shown that with more than double the gross income per acre, the 42 most profitable farms had the same labor cost per acre and somewhat lower horse power and machinery costs than were found on the 42 least profitable farms. This statement appears more significant since these records show that the actual value of man labor and the cost of horse and tractor power and machinery amounted to over $11.00 an acre on the average farm, while the income amounted to only $20.74 an acre.

What Cooperators Do To Make Good Use of Man Labor

1. Adopt cropping systems which will tend to make use of labor evenly throughout the year.

2. Grow and feed such livestock as will make use of available labor throughout the year and especially to provide productive winter work.

3. Fit the cropping system to the available labor supply. For illustration, farmers having boys in High School and College coming home for summer vacations may safely increase the alfalfa and wheat acreage above what could ordinarily be grown.

4. Plan ahead so as to have odd jobs and other work out of the way when the rush seasons for field work come.

5. Arrange the size, shape, and location of fields so as to save time in taking livestock to pasture and in doing the field work.

What Cooperators Do To Make Good Use of Horse Power and Machinery

1. Keep machinery under cover and protected from poultry and other livestock.

2. Clean, repair, paint, and oil machinery and harness regularly. On many of the more profitable farms this work is done in the winter with farm labor.

3. Study the use and care of expensive and more complicated machines such as tractors, trucks, threshing machines, corn huskers, combines, etc. On many farms the saving of labor by the use of labor saving machinery is overbalanced by the heavy depreciation and repair bills.

4. Keep only as many workable horses as are needed under ordinary conditions.

5. Feed horses according to the work done.

Thrift - The Keeping of Expenses Low in Proportion to Receipts

Some farms which produced good crop yields had a large proportion of the land in higher profit crops and made a good return for the feed fed to livestock, and had low net incomes because the expenses were high in proportion to the income.

In chart 6 the farms are grouped according to the total expense including the operator's and family labor for each $100 of gross income. As was to be expected, there was a regular decrease in the rate earned on the investment as the expenses in proportion to receipts increased.

Chart 6 - Rate Earned in Relation to the Proportion of Expenses to Receipts, 1925 Data

Expense for $100 gross income	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned in the total farm investments.	Rate earned	Net farm income
$30-50	41		XXXX

Size of Farms

The farms in this project vary from 40 to 640 acres in size. The type of soil is similar on most of the farms, except a few more farms between 141 and 180 acres in size were on a lighter type of soil. The average rate earned on the investment by the different groups of farms varied only from 2.6 percent to 3.1 percent in 1926. With the exception of the farms from 141 to 180 acres in size the average rate earned in 1925 varied from 3.0 percent to 3.9 percent (See Table 4).

Table 4 - FARM INCOME AS RELATED TO SIZE OF FARMS

Size of farm	1926		1925	
	Number of farms	Rate earned	Number of farms	Rate earned
40-140 acres	28	2.9	33	3.6
141-180 "	45	3.1	47	2.5
181-220 "	37	3.1	34	3.9
221-260 "	39	2.6	41	3.2
261-320 "	36	2.6	43	3.3
321-640 "	25	2.7	27	3.0
Total	210	2.8	225	3.2

The most favorable size of farm for both years based on the rate earned are the farms between 181-220 acres in size. In general the farms of this size or smaller make a larger rate on the investment than larger farms. Small farms usually have a larger income per acre and also due to the disadvantage of a small size these farms have a larger expense per acre. Even tho a good return on the investment is secured, a good sized farm is necessary to give a large return to the individual.

There are some disadvantages of the smaller sized farms which are clearly brought out in records on some of these farms. The number of acres of crops worked with one man and one horse gradually increase with the larger sized farm. Also the expense per acre for farm improvements, machinery and equipment, the value of all labor, and other expenses are higher on the small sized farms and gradually decrease as the acreage increases. This is to be expected since many of the farm improvements and much of the machinery and equipment have to be provided even with a small acreage and the cost is not increased proportionately as the size of farms increases. The small farm to be successful must have a good sized business. Some of the ways the operators of small farms are overcoming this disadvantage include:

1. Keeping more livestock, especially dairy cows and poultry
2. Selecting crops that give a large return per acre
3. Canning crops, or, especially in some localities near good markets, truck crops are grown to advantage
4. Renting additional land

Many large farms are less successful because they are not so carefully organized and operated. Some of the common faults of large farms are:

1. Land is badly scattered and not readily reached from the farmstead
2. Usually less livestock per acre is kept on large farms
3. A smaller percentage of the land is in legumes and too large a percentage of land is grown to oats or other low profit crops on many large farms
4. Yields are lower because less care is given the soil and work is not as well done on many farms where much of the labor is hired

ORGANIZATION AND PURPOSE OF THE FARM BUREAU-

FARM MANAGEMENT SERVICE PROJECT

The Farm Bureau-Farm Management Service Project was organized during the latter part of the year 1924. Its purpose is to assist the farmers cooperating in it to keep such farm accounts as will enable them to study the efficiency with which they are conducting their farm business and to help them to apply to their individual farms the practices in farm organization and operation which have proved profitable on other farms of a similar type. The cooperators in the project are farm bureau members of Livingston, McLean, Tazewell, and Woodford counties. The project is an outgrowth of the regular farm management extension work. The extension work in Farm Management was begun in Tazewell county in 1915 and some work was done in all of the four counties in 1916.

In Woodford county from 30 to 100 farmers completed farm accounts from 1916 to 1921 and beginning in 1921 over 100 records have been closed each year. Farm management tours have played an important part in developing interest in the work. The growing number of farmers keeping records made it impossible for the College of Agriculture to give as much assistance through the regular extension work as was desired by the farmers cooperating in the extension project. This was the situation that led to the organization of the Farm Bureau-Farm Management Service.

About sixty farm bureau members in each of the four counties agreed to cooperate in the project for the three years of 1925, 1926, and 1927. The total average cost is about twenty-five dollars per farm per year. One-third of the expense is borne by the University of Illinois. This leaves a cost per farm of about seventeen dollars per year. The fee per farm varies from ten to twenty dollars per year, depending on the size of the farm. In two of the counties the farm bureaus pay a portion of each fee, while in two counties the cooperators pay the entire fee of ten to twenty dollars.

The entire time of M. L. Mosher, one of the authors of this report, is given to the project. Each cooperator is being visited on his farm at least three times during each year.

The work is under the direction of H. C. M. Case, in charge of the Department of Farm Organization and Management acting in cooperation with an advisory committee consisting of one representative of each farm bureau. This committee consists of G. F. Bennett, Livingston County, Chairman, E. D. Lawrence, McLean County, W. C. Somer, Tazewell County, and J. Frank Felter, Woodford County, who is secretary-treasurer. This committee is responsible to the cooperating farm bureau for the custody and expenditure of the funds raised by the collection of the cooperators' fees. Each Farm Bureau collects the fees from its cooperating members and pays them over to the committee.

The organization of the project was made possible by the hearty support and assistance of the four Farm Advisers and their assistants. The Farm Advisers who were in charge of their counties when the work was organized are H. O. Allison, Livingston County, H. Fahrnkopf, McLean County, Ralph E. Arnett, Tazewell County, and P. E. Johnston, Woodford County. Mr. Johnston left the county in January 1925 to specialize in Farm Management and H. A. deWerff, the present Farm Adviser, has cooperated since the work was started.

THIRD ANNUAL REPORT

For the Cooperators in the
Farm Bureau-Farm Management Service
For the Year 1927

Prepared by M. L. Mosher and H. C. M. Case

An average of 3.7 percent on the entire farm investment, after deducting all expenses and $720 allowance for the value of the operator's labor, was made by the 200 farmers who are cooperators in the Farm Bureau-Farm Management Service and whose records were used in preparing this report. The average investment in land, buildings, livestock, and other equipment was $253.81 per acre with land valued at $192.84. Expressing the earnings in another way, these men after paying all expenses of operating their farms and allowing 5 percent interest charge on the investment lacked $46 per farm of getting any return for their own labor.

In addition to the above earnings each family secured produce from the farm which, based on records kept on 188 farms, amounted to $439.15 at farm prices. The investment in the farm residence and the expenses for repairs and upkeep on it were not included in these accounts. Therefore the use of the residence is not considered an income from the farm.

The income figures given in this report should not be considered as representative of all farms in these counties. A survey study of all farms in one township in McLean County in 1925 in about the center of the four counties included in this project, and similar studies of farm incomes made in Bond County in 1926 and in Henry County in 1927 indicate that the farms on which the records were kept in this project earned about 2 percent higher rate on the investment than the average of all farms in the same part of the state.

Differences in Earnings Between Farms

There are wide variations in the earnings on the most successful and the least successful farms. The 40 most profitable of the 200 farms made 5 percent interest on the investment and had $1,643 to pay the operator for his own labor and management, while the 40 least profitable farms lacked $1,352 of making 5 percent on the investment and left nothing to the operator for his own labor and management.

This amounts to a total difference of $2,995 in the return for the labor and management of the operators between the high and low groups of farms. This may be expressed in another way by saying, after all expenses were paid and the operator allowed $720 for his own labor, the most profitable group made 6.58 percent on the investment, while the least profitable group made only .9 percent on the money invested.

What Accounted for the Difference in Farm Earnings

The one-fifth most profitable farms (40 farms) had an income of $28.73 an acre, while the one-fifth least profitable farms had an income of only $17.06 per acre (see Table 2). The total expenses per acre on the two groups of farms were $12.42 and $14.77 per acre respectively. In other words, the most profitable group of farms with $2.35 less expense per acre received $11.67 larger returns per acre. The same table shows that the least profitable farms were somewhat smaller in size on the average and that they had a little larger investment per acre.

Location of Differences in Incomes between the More Profitable and the Less Profitable Farms

Most of the difference of approximately $3,000 in the average net earnings for each of the 40 most profitable and the 40 least profitable farms is accounted for in Chart 1.

Chart 1. Location of Differences in Incomes between the 40 Most Profitable and the 40 Least Profitable Farms. 1927 data.

Factors considered	The lengths of the shaded bars are in proportion to the amounts of the differences	Average difference in incomes
Crop yields	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	735
Kind of crops	XXXXXXXXX	146
Amount of livestock	XXXX	57
Efficiency of livestock	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	625
Efficiency of man labor	XXXXXXXXXXXXX	215
Efficiency of power and mach'y	XXXXXXXXXXXXXXXXX	269
Other expenses	XXXXXX	93

Crop Yields - The yields per acre on the most profitable farms were: corn 45.1 bushels, oats 35.0 bushels, wheat 18.1 bushels and hay 1.8 tons. On the least profitable group the yields were: corn 36.9 bushels, oats 30.8 bushels, wheat 15.8 bushels and hay 1.4 tons. These differences of 8.2 bushels of corn, 4.2 bushels of oats, 2.3 bushels of wheat and .4 tons of hay were applied to the average acreages of those crops on the two groups of farms. With corn valued at 65 cents per bushel, oats at 45 cents, wheat at $1.25 and hay at $15.00 per ton and proportional values to the small amounts of land in other crops, the total difference in value of crops on the average farm in each of the two groups of farms amounts to $735. (See Chart 1)

Kinds of Crops Grown - The more profitable farms had a larger proportion of land in the more profitable crops of corn, wheat, alfalfa, sweet clover and canning crops but a smaller acreage of oats, bluegrass and timothy than were grown on the less profitable farms. This difference accounts for about $146. (See Chart 1).

Amount of Livestock - The more profitable farms fed $1,796.75 worth of feed valued at farm prices while $1,644.74 worth of feed was fed on the less profitable farms. As an average of the two groups, for each $100 worth of feed fed there were livestock returns of $137.28; that is, the product from $100 worth of feed fed on the farm was worth $37.28 more than the farm price of the feed. This difference applied to the additional $152.01 worth of feed used on the more profitable farms accounts for about $57 of the total difference between the two groups.

Efficiency of Livestock - The 40 more profitable farms realized $155.44 from each $100 worth of feed fed to productive livestock while the 40 less

profitable farms received only $119.12 or a difference of $36.32 for each $100 worth of feed used. The average amount of feed used on the two groups of farms was valued at $1,720.74 at farm prices. The larger returns for each $100 of this feed used on the more profitable farms accounts for about $625 of the difference in average farm income between the two groups of farms. This does not include the cost of keeping horses on the two groups of farms. This greater income to the more profitable farms for each $100 worth of feed used was apparent in case of each class of livestock. For beef cattle, the difference was $52.41, mixed beef and dairy herds $28.71, dairy herds $53.08, hogs $23.07, sheep $131.04, and poultry $61.26.

Less than one-half of the grain produced on these farms was fed, the rest being sold as grain. In areas where all the grain is fed on the farms, this matter of livestock efficiency becomes relatively more important.

Efficiency of Man Labor - The total labor cost, including the operator's and family labor at hired man rates, was $6.27 per acre on the 40 more profitable farms and $7.26 on the less profitable ones. This difference of 99 cents per acre applied to the average size of farms in the two groups amounts to $215. This is more significant when one realizes that the returns were nearly twice as high on the more profitable farms.

Power and Machinery Costs - The total cost per acre of horse and tractor power and machinery on the most profitable farms amounted to only $3.87 per acre compared with a cost of $5.11 per acre on the least profitable farms. This difference in cost of power and machinery of $1.24 per acre would amount to a difference of $269 less cost per farm in favor of the most profitable farms.

Other Expenses - Expenses other than labor, power and machinery amounted to $4.44 and $4.87 per acre on the respective groups of farms. This difference of 43 cents per acre accounted for $93 in the differences in net incomes of the two groups of farms.

In noting the differences in earnings between these two groups of farms it should be recognized that the operators of many of the more profitable farms have spent from five years to a generation in improving the soil, selecting good seed, establishing a good cropping system, developing efficient herds of livestock and in equipping their farms for economical operation in accordance with a carefully worked out plan. Even tho it may require some time to bring a farm from a low profit to a high profit farm, the difference in earnings justifies the effort in developing a well balanced farm.

Table 1. SUMMARY OF THE YEAR'S FARM BUSINESS

Your summary as shown on pages 34 and 35 of your book compared with 200 farms, the forty most profitable and the forty least profitable farms.

	Items	Your farm	Average of 200 farms	40 most profitable farms	40 least profitable farms
1	Capital Investments - Total	$_____	$58,756	$58,469	$50,534
2	Land		44,641	45,695	37,627
3	Farm improvements		5,541	4,777	4,900
4	Machinery and equipment		1,939	1,799	1,941
5	Feed, grain and supplies		3,457	3,515	2,960
6	Livestock - Total		3,178	2,683	3,106
7	Horses		765	687	671
8	Cattle		1,058	808	1,141
9	Hogs		989	916	883
10	Sheep		176	87	157
11	Poultry		172	179	174
12	Bees		18	6	80
13	Receipts - Net Increases-Total	$_____	$ 5,274	$ 6,780	$ 3,382
14	Farm improvements		---	---	---
15	Feed, grain and supplies		2,683	4,007	1,354
16	Labor off the farm		67	128	32
17	Miscellaneous		8	14	7
18	Livestock - Total		2,516	2,631	1,989
19	Horses		5	25	---
20	Cattle		562	490	572
21	Hogs		1,247	1,342	868
22	Sheep		67	52	42
23	Poultry		110	152	115
24	Egg sales		140	149	111
25	Dairy sales		380	419	260
26	Bees		5	2	21
27	Expenses - Net Decreases-Total	$_____	$ 2,136	$ 2,006	$ 1,918
28	Farm improvements		256	221	244
29	Machinery and equipment		469	404	511
30	Feed, grain and supplies		---	---	---
31	Miscellaneous livestock expense		49	47	40
32	Miscellaneous crop expense		255	252	228
33	Hired labor		573	554	429
34	Taxes, insurance, etc.		483	477	410
35	Miscellaneous expenses		46	51	44
36	Horses - decreases		--	--	12
37	Miscellaneous livestock decreases		--	--	--
38	Receipts less expenses	$_____	$ 3,138	$ 4,774	$ 1,464
39	Operator's and family labor		951	925	1,009
40	Net income from investment	_____	2,187	3,849	455

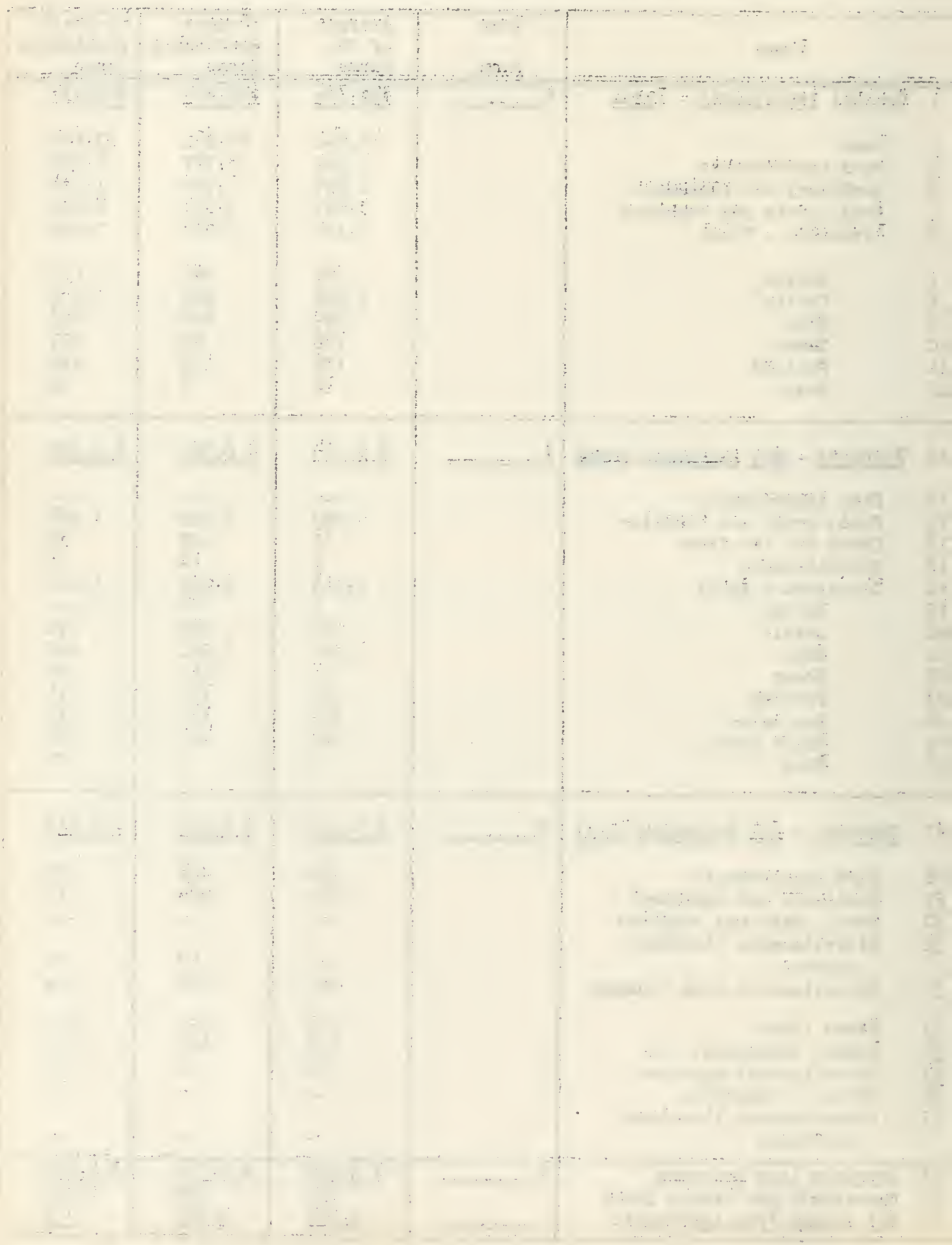


Table 2 - IMPORTANT FACTORS BY WHICH THE FARM BUSINESS MAY BE STUDIED
Underlined factors are the ones used on the chart, Page 6

Item	Your farm	Average of 200 farms	40 most profitable farms	40 least profitable farms
Rate earned on investment	%	3.72%	6.58%	0.90%
Labor and management wage	$	$ - 46.	$1,643.	$-1,352.
Gross receipts per acre		22.78	28.73	17.06
Total expense per acre		13.33	12.42	14.77
Net receipts per acre		9.45	16.31	2.29
Size of farm		231.5	236.0	198.2
Total investments per acre	$	$ 253.81	$ 247.75	$ 254.96
Land		192.84	193.63	189.85
Farm improvements		23.94	20.24	24.72
Machinery and equipment		8.38	7.62	9.79
Feed, grain and supplies		14.93	14.89	14.93
Horses		3.30	2.91	3.39
Productive livestock		10.42	8.46	12.28
Corn - Bushels per acre		42.0	45.1	36.9
Oats - Bushels per acre		34.5	35.0	30.8
Wheat - Bushels per acre		16.8	18.1	15.8
Hay - Tons per acre		1.7	1.8	1.4
Percent of farm tillable		90.2	92.2	88.3
Percent of tillable land in				
Higher profit crops		59.9	62.9	56.0
Corn		44.6	46.9	41.6
Wheat		7.1	9.8	4.6
Alfalfa		2.3	1.9	2.5
Sweet clover		5.2	3.7	6.5
Canning crops		.7	.6	.8
Medium profit crops		13.2	12.6	11.7
Clover		3.5	3.4	1.6
Clover and timothy mixed		2.6	2.0	2.7
Barley, soybeans, etc.		7.1	7.2	7.4
Low profit crops		26.9	24.5	32.3
Oats		21.5	19.5	26.1
Timothy		1.7	1.9	1.9
Bluegrass		3.7	3.1	4.3
All legumes		15.9	13.2	15.2
All grain and hay crops		88.1	91.2	86.2

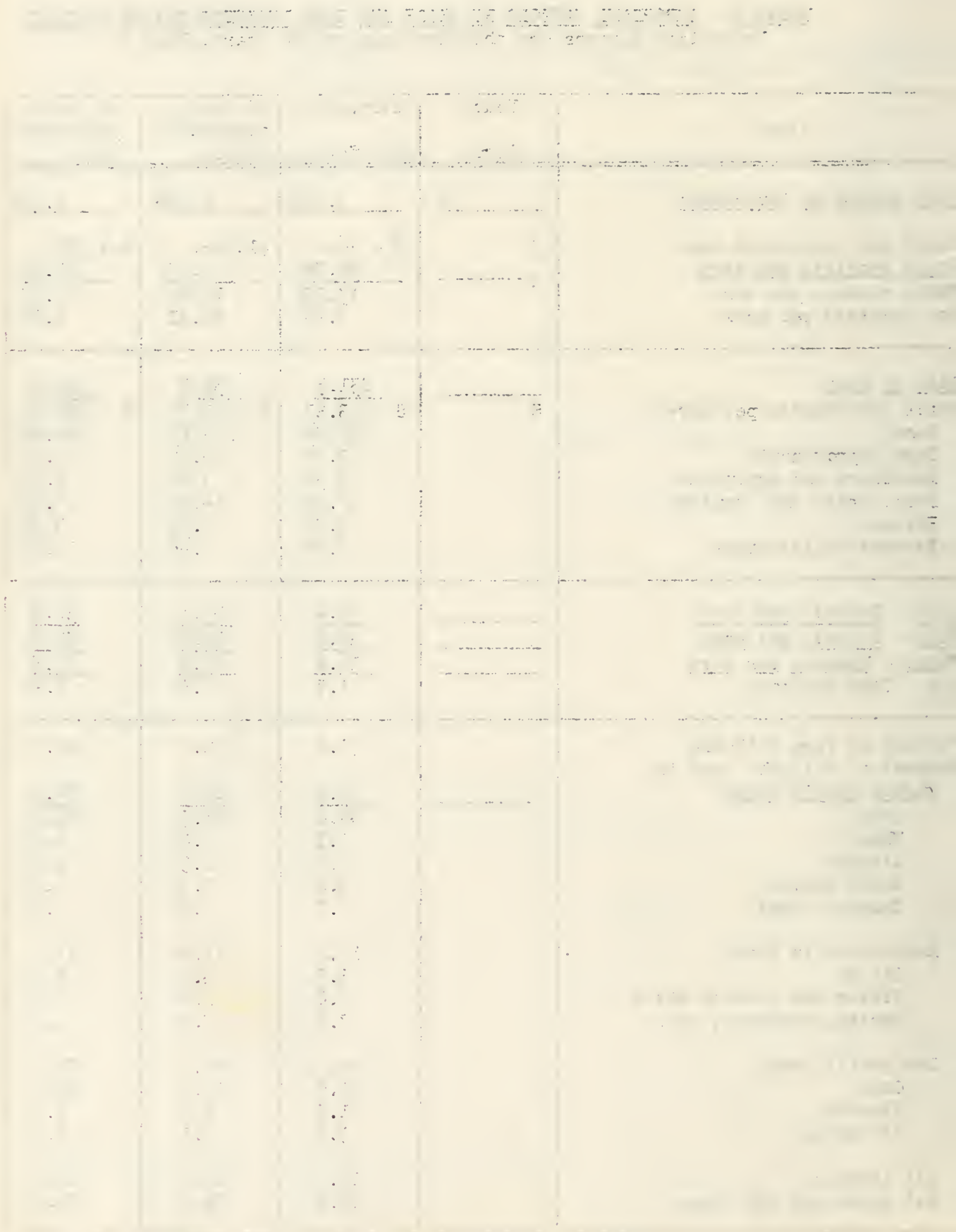


Table 2 - (Continued)

Item	Your farm	Average of 200 farms	40 most profitable farms	40 least profitable farms
Productive livestock				
Investment per acre	$_____	$ 10.28	$ 8.82	$ 11.91
Returns per acre		10.85	11.04	10.04
Value of feed fed to all productive livestock		2,061.88	1,796.75	1,644.74
Returns per $100 feed fed to				
All productive livestock		134.57	155.44	119.12
Beef cattle	_____	122.11	146.08	93.67
Mixed cattle	_____	141.17	158.56	129.85
Dairy cattle	_____	148.73	178.53	125.45
Hogs	_____	119.78	130.44	107.37
Sheep	_____	102.56	186.65	55.61
Poultry		236.13	289.72	228.46
Pounds of pork produced		17,132.	16,897.	12,982.
Feed cost per 100 pounds of pork	$	$ 6.61	$ 6.37	$ 7.11
Returns per 100 pounds of pork		7.92	8.31	7.63
Pounds of pork per acre		74.0	71.6	65.5
Returns per $100 invested in poultry	$_____	$ 195.12	$ 222.25	$ 177.29
Average number of hens kept		109.5	110.8	102.0
Number of eggs per hen		93.8	95.9	89.6
Labor and power				
Percent of farms with tractors		74.0	67.5	77.5
Percent of farms with trucks		30.0	22.5	42.5
Percent with tractors and trucks		26.0	20.0	37.5
Percent without tractors or trucks		22.0	30.0	17.5
Crop acres per man		93.5	100.6	82.3
Crop acres per horse		25.1	27.8	21.2
Hired and home labor per acre of farm	$_____	$ 6.58	$ 6.27	$ 7.26
Labor efficiency index		104.0	107.3	97.7
Horse feed and depreciation per acre of farm	$	$ 2.35	$ 2.16	$ 2.53
Machinery cost per acre of farm		2.03	1.71	2.58
Horse and machinery cost per acre		4.38	3.87	5.11
Power and mach'y efficiency index		105.3	117.1	93.3
Expenses per $100 gross income	$_____	$ 58.53	$ 43.23	$ 86.55
Expenses per acre of whole farm		13.33	12.42	14.77
Farm improvements		1.11	.93	1.23
Horses		--	--	.06
Machinery and equipment		2.02	1.71	2.58
Feed, grain and supplies		--	--	--
Miscellaneous livestock expense		.21	.20	.20
Miscellaneous crop expense		1.10	1.07	1.15
Hired and home labor		6.58	6.27	7.26
Taxes, insurance, etc.		2.11	2.02	2.07
Miscellaneous		.20	.22	.22
Family living furnished by 181 farms				
Farm produce used in home	$	$ 439.15	$ 423.86	$ 440.57
House rent (10 percent of value)		472.83	477.04	412.30
Total living furnished by farm		911.98	900.90	852.87
Size of family		4.9	5.2	4.8

Table 3 - FIND YOUR FARM LEAKS

The numbers above the double line across the middle of the page are the averages for the 200 farms used in this summary of the factors named at the tops of the columns. By drawing a line across each column at the number measuring the efficiency of your farm as shown in Table 2, you can compare your efficiency with that of the other farms in the project.

Rate earned on invest-ment	Bushels per acre			Per-cent land in high prof-it crops	Livestock returns per $100 feed				In-vest-ment in L.S. per acre	Size of farm	Percent efficiency		Ex-pense per $100 gross in-come	Gross income per acre
	Corn	Oats	Wheat		Cat-tle	Hogs	Sheep	(1) Hens			Man lab-or	Horse and ma-chin-ery		
11.7	82	74	49	100		200	262	355	26	552	184	185	19	47
10.7	77	69	45	95		190	242	335	24	512	174	175	24	44
9.7	72	64	41	90		180	222	315	22	472	164	165	29	41
8.7	67	59	37	85		170	202	295	20	432	154	155	34	38
7.7	62	54	33	80		160	182	275	18	392	144	145	39	35
6.7	57	49	29	75		150	162	255	16	352	134	135	44	32
5.7	52	44	25	70		140	142	235	14	312	124	125	49	29
4.7	47	39	21	65		130	122	215	12	272	114	115	54	26
3.7	42	34	17	60		120	102	195	10	232	104	105	59	23
2.7	37	29	13	55		110	82	175	8	192	94	95	64	20
1.7	32	24	9	50		100	62	155	6	152	84	85	69	17
.7	27	19	5	45		90	42	135	4	112	74	75	74	14
-.3	22	14	1	40		80	22	115	2	72	64	65	79	11
-1.3	17	9	-	35		70	2	95	0	32	54	55	84	8
-2.3	12	4	--	30		60	-18	75	-	-	44	45	89	5

(1) Returns per $100 invested used for poultry.

Profitable Farming Requires Balanced Farming

Weaknesses in some parts of the farm business often offset the advantages gained at other points. Records from hundreds of farms kept during the past twelve years together with other studies show that among the factors which affect farm earnings each of the following has its place:

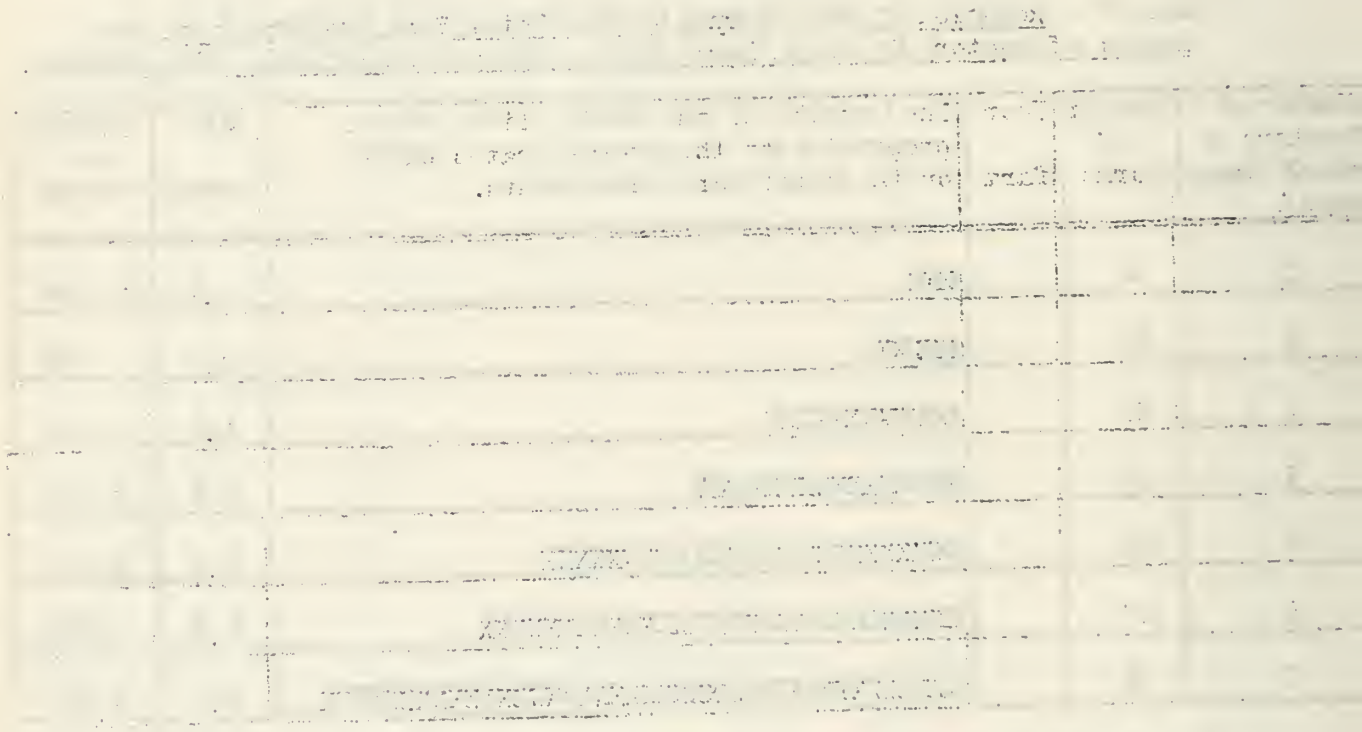
1. Crop yields
2. Kind of crops grown
3. Livestock efficiency
4. Use of man labor
5. Use of power and machinery
6. Relation of expenses to receipts
7. Amount of livestock
8. Volume of business
9. Diversification of crops
10. Production in accord with market demands
11. Arrangement of fields and farmstead .

In Chart 2 is shown the value of doing at least fairly well along the line of each of the first six factors named above. Farms on which complete records were kept in 1925 and 1926 were divided into seven groups according to the number of those six factors in which each farm did more efficient work than the average of all the farms studied each year.

Chart 2 - Relation of Rate Earned on the Total Farm Investment to the Number of Factors in Which Farms Excel. Data from 1925 and 1926 Records.

Number of factors in which farms excel	Number of farms	Your farm	The lengths of the shaded lines are in proportion to the average rates earned on the total farm investments.	Rate earned	Average net income
0	4		XXX	.5	$ 298
1	25		XXXXXX	1.0	596
2	42		XXXXXXXXXXXX	1.9	1,133
3	52		XXXXXXXXXXXXXXXXX	2.8	1,670
4	45		XXXXXXXXXXXXXXXXXXXXXXXXX	4.3	2,565
5	27		XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.8	2,863
6	8		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	6.5	3,877

It may well be noted that as an average of two years those few farms which were doing better than the average along all six lines of farm work earned 6.5 percent on their total farm investments, while those which were below the average in all factors earned only .5 percent. Applied to the average farm investment, this meant a difference of about $3,500. With considerable regularity, the rates earned on the seven groups of farms increased as the number of factors in which the farms excelled increased. Each of the above factors is discussed briefly on the following pages.



Crop Yields

Good crop yields are, as a general rule, essential for good net farm incomes. Chart 3 shows the relation found in 1925 and 1926 between the yields of corn on the farms of the cooperators and the rates earned on the total farm investments. It should be understood that not all of the indicated increase of net income on the farms having higher yields of corn is due to the increased corn yield. The tendency is for the same farms which have good corn yields to have good yields of other crops, larger proportions of tillable land in the higher profit crops, and to have higher returns for feed fed to livestock.

Chart 3 - Rate Earned as Related to the Yield of Corn

The rates earned on the different groups of farms were affected more or less by other factors such as percent of land in higher profit crops and efficiency in feeding livestock.

Yield of corn	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned on the total farm investments	Rate earned	Average net incomes
28-47 41.8 av.	40		XXXXXXXXXXXXXXXXXX	1.8	$1,074
47-51 49.1 av.	40		XXXXXXXXXXXXXXXXXXXXXXXXX	2.4	1,432
51-56 53.4 av.	40		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.3	1,968
56-61 58.2 av.	40		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.5	2,088
61-79 65.9 av.	40		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.3	2,565

It may well be noted that for the years 1925 and 1926 an increase of ten bushels per acre of corn was accompanied by an increase of about one percent in the rate earned on the investment. On the average farm this meant that with each ten bushels increase in yield of corn there was about $600 increase in the total net return for the farm.

What Cooperators Do to Secure Good Crop Yields

1. Use varieties and strains of corn, wheat, oats, etc., which long-time investigations of the experiment stations have proved to be high-yielding and adapted to the conditions.
2. Make germination tests of representative samples of all seeds.
3. Test for disease at least enough seed corn to plant a small field on which no corn had been grown for two or more years from which to select the next year's seed. Treat seed oats and wheat for smut each year.

Any tenant or landowner in difficult financial condition can do the above things almost as easily as the most prosperous landowner.

4. Use a cropping system which provides that each field is left in some deep-rooted legume at least once in four or five years.
5. Use a definite plan for the efficient use of all available manure.
6. Use limestone and rock phosphate on soil types where investigations show that they can be used profitably.

Value of Growing Profitable Kinds of Crops

It often happens that a farm which has good crop yields and where efficient work with livestock is done is relatively unprofitable because a large part of the tillable land is used in growing crops which do not give as good returns for the land, labor, power, and machinery as do other crops which might be grown.

Chart 4 shows the relation of the rates earned on these farms and the percent of tillable land in the combined acreage of the higher profit crops of corn, wheat, alfalfa, sweet clover and canning crops of sweet corn, peas, and pumpkin. The selection of corn and wheat as the higher profit grain crops, of alfalfa as the higher profit hay crop, and of sweet clover as the higher profit pasture crop for tillable land was based on long-time investigations of the Departments of Farm Organization and Management and Animal Husbandry of the University of Illinois.

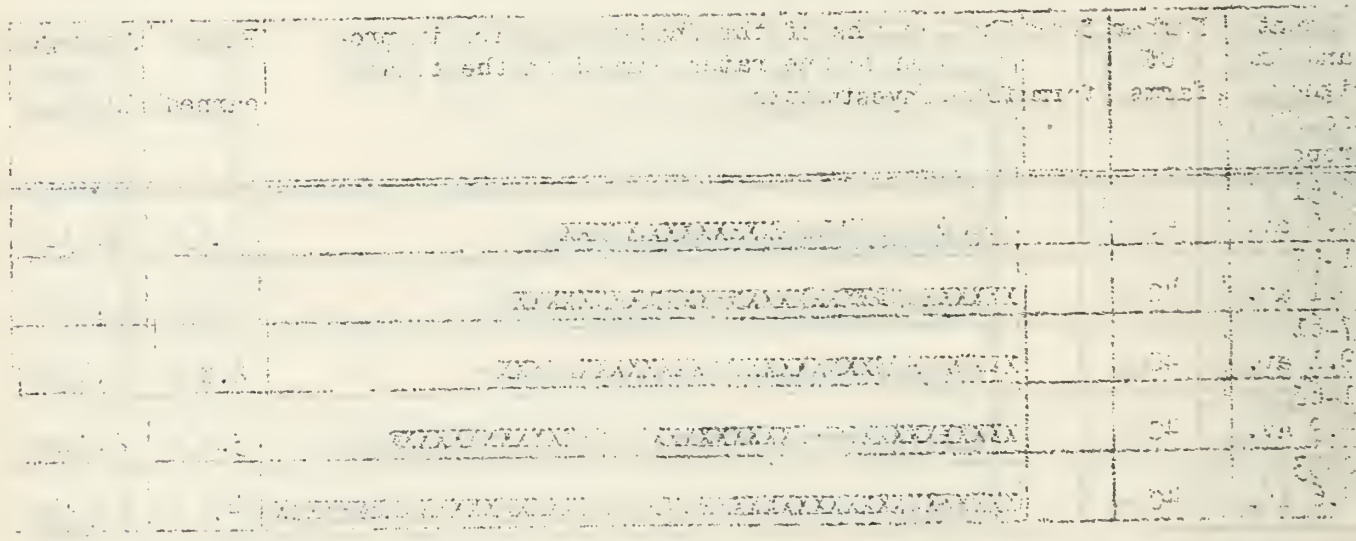
Chart 4 - Rate Earned as Related to the Percent of Land in the Higher Profit Crops

It should be understood that part of the increased net income was due to better crop yields, better handled livestock, etc., on the same farms. Data show averages of 1925 and 1926 records.

Percent land in higher profit crops	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned on the total farm investments	Rate earned	Average net income
29-51 44.8 av.	40		XXXXXXXXXXXXXXXXXXXXXXXXXX	2.4	$1,431
51-57 54.1 av.	40		XXXXXXXXXXXXXXXXXXXXXXXXXXXX	2.7	1,610
57-61 59.1 av.	40		XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	2.8	1,670
61-68 64.9 av.	40		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.4	2,028
68-93 75.6 av.	40		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.0	2,386

It will be noted in Table 2 that 46.9 percent of the tillable land on the 40 most profitable farms was in corn. It is doubtful if it is ever wise to have more than fifty percent of the tillable land in corn or any other one crop, because of the uneven distribution of labor, difficulty of maintaining soil fertility, difficulty of controlling weeds and insects and the risk of storms or other uncontrollable conditions which may seriously injure one crop but do little damage to others.

It is apparent that those cooperators who are farming most profitably are, in most cases, men who have almost done away with timothy and bluegrass on tillable land and have reduced the acreage of oats.



Relation of Amount and Efficiency of Livestock to Farm Incomes

Efficient care and feeding of livestock is essential for the best net farm incomes. Those farms having a small amount of livestock well handled had larger net incomes than farms having large amounts of livestock poorly handled. With the favorable prices of livestock in relation to prices of grain during 1925 and 1926 the farms which fed most of their grain to well handled livestock had net incomes about $2,000 higher than farms having small amounts of livestock poorly handled.

Chart 5 - Relation of the Rate Earned and the Amount and Efficiency of Livestock

It should be understood that the rates earned were affected also by the crop yields, percent of land in higher profit crops, etc.,- averages of 1925 and 1926 data.

Returns for $100 feed	Number of farms[1]	Your farm	The lengths of the shaded bars are in propór-tion to the rates earned by the different groups of farms	Rate earned	Average net income
Less than $6.25 invested in productive livestock per acre - $4.26 average					
$ 78-145	20		XXXXXXXXXXXXXX	1.6	$ 954
$148-194	20		XXXXXXXXXXXXXXXXXX	2.2	1,312
$197-341	20		XXXXXXXXXXXXXXXXXXXXXXXXXXX	3.1	1,849
From $6.49 to $11.67 invested in productive livestock per acre - $8.89 average					
$ 74-151	20		XXXXXXXXXXXXXXX	1.8	1,074
$153-176	20		XXXXXXXXXXXXXXXXXXXXXXXXXXX	3.6	2,147
$176-252	20		XXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.7	2,207
More than $11.72 invested in productive livestock per acre - $18.46 average					
$ 78-141	20		XXXXXXXXXXXXXXX	1.9	1,133
$143-167	20		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.5	2,684
$171-230	20		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	5.0	2,982

[1]There were 20 farms in each group in 1925 and 19 farms in each group in 1926.

Those farms in the first three groups which had an average of only about four dollars per acre invested in productive livestock sold a large portion of their crops while those in the last three groups which had an average of $18.50 per acre invested in livestock fed most of their grain.

A few of the more important things the cooperators do to get high returns for feed fed to livestock are:

1. Use the best types of breeding stock.
2. Study market conditions carefully as a guide to the purchase and sale of cattle, sheep and hogs.
3. Follow proved plans for keeping livestock healthy, such as the McLean County System of Swine Sanitation and the growing of chicks on clean ground.
4. Use rotated legume pastures which provide clean feeding grounds and the necessary protein and minerals in the rations.
5. Grow their own feeds, especially legumes, for the proper feeding of the livestock.
6. Purchase sufficient unmixed high protein products, such as tankage, oil meal, and cottonseed meal to balance the home-grown feeds.

Efficiency in the Use of Man Labor and Horse Power and Machinery

While the efficient use of man labor and of horse power and machinery are important as they affect the net farm incomes, no divisions of the farms into groups according to such efficiencies have yet been made. In Table 2, page 4, it is shown that with nearly double the gross income per acre the 40 most profitable farms had nearly one dollar per acre less labor cost and $1.24 per acre lower horse power and machinery costs than were found on the 40 least profitable farms. This statement appears more significant since these records show that the actual value of man labor and the cost of horse and tractor power and machinery amounted to almost $11.00 an acre on the average farm, while the income amounted to only $22.78 an acre.

What Cooperators Do to Make Good Use of Man Labor

1. Adopt cropping systems which will tend to make use of labor evenly throughout the year.

2. Grow and feed such livestock as will make use of available labor throughout the year and especially to provide productive winter work.

3. Fit the cropping system to the available labor supply. For illustration, farmers having boys in High School and College coming home for summer vacations may safely increase the alfalfa and wheat acreage above what could ordinarily be grown.

4. Plan ahead so as to have odd jobs and other work out of the way when the rush seasons for field work come.

5. Arrange the size, shape and location of fields so as to save time in taking livestock to pasture and in doing the field work.

What Cooperators Do to Make Good Use of Horse Power and Machinery

1. Keep machinery under cover and protected from poultry and other livestock.

2. Clean, repair, paint and oil machinery and harness regularly. On many of the more profitable farms this work is done in the winter with farm labor.

3. Study the use and care of expensive and more complicated machines such as tractors, trucks, threshing machines, corn huskers, combines, etc. On many farms the saving of labor by the use of labor saving machinery is overbalanced by the heavy depreciation and repair bills.

4. Keep only as many workable horses as are needed under ordinary conditions.

5. Feed horses according to the work done.

Thrift - The Keeping of Expenses Low in Proportion to Receipts

Some farms which produced good crop yields had a large proportion of the land in higher profit crops and made a good return for the feed fed to livestock, and had low net incomes because the expenses were high in proportion to the income.

In Chart 6 the farms are grouped according to the total expense including the operator's and family labor for each $100 of gross income. As was to be expected, there was a regular decrease in the rate earned on the investment as the expenses in proportion to receipts increased.

Chart 6 - Rate Earned in Relation to the Proportion of Expenses to Receipts Averages of 1925 and 1926 Data

Expense for $100 gross income	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned in the total farm investment.	Rate earned	Net farm income
$ 35-52	40		XXXX

ORGANIZATION AND PURPOSE OF THE FARM BUREAU-FARM MANAGEMENT SERVICE

The Farm Bureau-Farm Management Service Project was organized during the latter part of the year 1924. Its purpose is to assist the farmers cooperating in it to keep such farm accounts as will enable them to study the efficiency with which they are conducting their farm business and to help them to apply to their individual farms the practices in farm organization and operation which have proved profitable on other farms of a similar type. The cooperators in the project are farm bureau members of Livingston, McLean, Tazewell, and Woodford counties. The project is an outgrowth of the regular farm management extension work. The extension work in Farm Management was begun in Tazewell county in 1915 and some work was done in all of the four counties in 1916.

In Woodford county from 30 to 100 farmers completed farm accounts from 1916 to 1921 and beginning in 1921 over 100 records have been closed each year. Farm management tours have played an important part in developing interest in the work. The growing number of farmers keeping records made it impossible for the College of Agriculture to give as much assistance through the regular extension work as was desired by the farmers cooperating in the extension project. This was the situation that led to the organization of the Farm Bureau-Farm Management Service.

About sixty farm bureau members in each of the four counties agreed to cooperate in the project for the three years of 1925, 1926 and 1927. The total average cost is about thirty dollars per farm per year. About 40 percent of the expense is borne by the University of Illinois. This leaves a cost per farm of about seventeen dollars per year. The fee per farm varies from ten to twenty dollars per year, depending on the size of the farm. In two of the counties the farm bureaus pay a portion of each fee, while in two counties the cooperators pay the entire fee of ten to twenty dollars.

The entire time of M. L. Mosher, one of the authors of this report, is given to the project. Each cooperator is being visited on his farm at least three times during each year. The work is under the direction of H. C. M. Case, in charge of the Department of Farm Organization and Management acting in cooperation with an advisory committee consisting of one representative of each farm bureau. This committee consists of G. F. Bennett, Livingston County, Chairman, E. D. Lawrence, McLean County, W. C. Somer, Tazewell County, and J. Frank Felter, Woodford County, who is secretary-treasurer. This committee is responsible to the cooperating farm bureau for the custody and expenditure of the funds raised by the collection of the cooperators' fees. Each Farm Bureau collects the fees from its cooperating members and pays them over to the committee.

The organization of the project was made possible by the hearty support and assistance of the four Farm Advisers and their assistants. The Farm Advisers who were in charge of their counties when the work was organized are H. O. Allison, Livingston County, H. Fahrnkopf, McLean County, Ralph E. Arnett, Tazewell County, and P. E. Johnston, Woodford County. Mr. Johnston left the county in January 1925 to specialize in Farm Management and H. A. deWerff, the present Farm Adviser, has cooperated since the work was started.

Most of the cooperators are continuing the work during 1928. A complete analysis of the past three years' records will be made and returned to the cooperators in the fall. Plans are now under way for reorganizing the project during the fall of 1928 for another period of years.

FOURTH ANNUAL REPORT FOR THE COOPERATORS IN THE FARM BUREAU-FARM MANAGEMENT SERVICE FOR THE YEAR 1928

M. L. Mosher, J. B. Andrews and H. C. M. Case

The one hundred-fifty farmers in east central Illinois who kept records in the Farm Bureau-Farm Management Service in Livingston, McLean, Tazewell and Woodford counties, for 1928 earned as pay for use of the capital invested and for the management and risk of operating the business, an average of 5.66 percent on their investments. A wage of $60 a month was allowed as pay for the operator's labor, no salary being deducted for management. No satisfactory method of valuing management on farms has been found, but if we allow one percent of the investment as pay for management, in this case amounting to $590, there remains a rate of 4.66 percent as pay for the risk and use of capital invested. If, instead of deducting a labor wage for the operator, we deduct five percent of the investment as pay for the risk and use of capital, we may assume that the remaining income is pay for labor and management. Following this plan it is found that the average farm operator of this group had a labor and management wage of $1084. If it is assumed that the labor performed by the operator is worth $60 a month or $720 a year, there is $364 left as pay for the risk and management in operating the business.

It should be kept in mind that these figures do not represent the average farmer in this locality. The accounts on which they are based were kept by farm operators who are progressive and businesslike enough not only to keep accounts but to pay for five to twenty dollars each per year for assistance in the keeping and the analyzing of their records. During each of the last four years field studies have been made of incomes on all farms in selected areas. These have shown consistently that the rate earned on farms included in this project average about two percent higher on the total farm investment than on the average of all farms in the same locality. We, therefore, would estimate that the average farmer in east central Illinois earned about 3.66 percent on his investment for 1928 to pay for use of capital, risk and management.

Farm earnings vary widely from year to year, and 1928 was the best year for this area since 1924, but these earnings were low as compared with other representative lines of business. Nine hundred companies representing a large number of industries for which reports are available for 1928 show an average rate earned on their net worth of 12.1 percent. These industries pay for management in the form of salaries to managers and officers before the rate earned on their net worth is figured.

To judge the meaning of a given rate earned on the investment it is necessary to know something of the valuation on which the investment is computed. The average value of the land included in this report was placed at $189.47 an acre. Other items including improvements, equipment, livestock, and feed made a total investment of $251.74 an acre.

The home grown farm produce used by the farm family is not included in the income figures as stated in this report. The farm products used at home were

found to have an average value of from $496.42 per farm at farm prices. This item of produce may be considered as labor income for the farm operator in addition to the labor wage deducted in the accounts.

Differences in Earnings Between Farms

The usual wide variations in the earnings on the most successful and the least successful farms may well be noted (See Table 1). The 30 most profitable of the 150 farms made 5 percent on the investment and had an average of $2737.32 to pay each operator for his own labor and management, while the 30 least profitable farms lacked $716.48 per farm of making 5 percent on the investment and left nothing to the operator for his own labor and management.

This amounts to a total difference of $3453.80 per farm per year in the return for the labor and management of the operators between the high and low groups of farms. This may be expressed in another way by saying, after all expenses were paid and the operator allowed $720 for his own labor, the most profitable group made 8.48 percent on the investment, while the least profitable group made only 2.17 percent on the money invested.

The one-fifth most profitable farms (30 farms) had a total income of $35.09 an acre, while the one-fifth least profitable farms had an income of only $20.25 per acre (see Table 2). The total expenses per acre with no charge for interest on the investment on the two groups of farms were $13.48 and $15.02 per acre respectively. In other words, the most profitable group of farms with $1.54 less expense per acre received $14.84 larger returns per acre. The same table shows that the least profitable farms were somewhat smaller in size on the average and that they had a little smaller investment per acre.

Two Opportunities for Increasing Farm Incomes

Farm earnings may be increased through "What the farmer can do for himself" and "What farmers can do in cooperation." While this report deals with the former, the latter means of helping farmers is important. It is concerned with such matters as the adjustment of tariffs, transportation rates and taxes and the handling of seasonal surpluses of agricultural products. These and similar problems require the organized effort of farmers if they are to present their case effectively before legislative and governmental boards and commissions and in conferences with other groups.

Regarding what the farmer can do for himself, that is concerned with the efficiency with which he operates his own farm business. The wide differences in earnings on farms included in this study operated under similar conditions of soil, climate and markets, show that the individuals have a large opportunity of improving their incomes. This can be accomplished through adopting plans for the organization and operation of their farms which have proved most profitable. In fact the earnings on most farms can be increased more through increased efficiency in operation than can be expected through any rational adjustments of tariff, freight rates or taxes or improved handling of seasonal surpluses.

Increased efficiency on the best corn belt land is justified as a safe means of increasing the farm income as it is the most effective way of reducing

the costs of production. Likewise it will be an effective way of discouraging further expansion of farming to cheap marginal land which should be held out of agricultural production under present conditions.

A careful study of his report by each cooperator will, it is believed, enable him to know rather definitely where he can most readily increase the efficiency of his farm business and how other farmers have more successfully conducted that part of the farm work.

Location of Differences in Incomes Between the More Profitable and the Less Profitable Farms

Most of the difference of approximately $3500 in the average net earnings for each of the 30 most profitable and the 30 least profitable farms is accounted for in Chart 1.

Chart 1. Location of Differences in Incomes Between the 30 Most Profitable and the 30 Least Profitable Farms

Factors considered	The lengths of the shaded bars are in proportion to the amounts of the differences	Average difference
Crop yields	XXXX

feed used. The average amount of feed used on all farms was valued at $2424.92 at farm prices. The larger returns for each $100 of this feed used on the more profitable farms accounts for $790.52 of the difference in average farm income between the two groups of farms. This does not include the cost of keeping horses on the two groups of farms. This greater income to the more profitable farms for each $100 worth of feed used was apparent in case of each class of livestock. For beef cattle, the difference was $62.72, mixed beef and dairy herds $16.29, dairy herds $35.99, hogs $32.65, sheep $20.17, and poultry $28.13.

About one-half of the grain produced on these farms was fed, the rest being sold as grain. In areas where all the grain is fed on the farms, this matter of livestock efficiency becomes relatively more important.

Kinds of Crops Grown - The more profitable farms had a larger proportion of land in the more profitable crops of corn, wheat, alfalfa, sweet clover and canning crops but a smaller acreage of oats, blue grass and timothy than were grown on less profitable farms. The differences in the relative proportions of corn, wheat, oats, and barley accounts for $264.64. (See Chart 1)

Power and Machinery Costs - The total cost per acre of horse and tractor power and machinery on the most profitable farms amounted to only $4.09 per acre compared with a cost of $4.92 per acre on the least profitable farms. This difference in cost of power and machinery of 83 cents per acre would amount to a difference of $194.72 less cost per farm in favor of the most profitable farms.

Miscellaneous Expenses - Expenses other than labor, power and machinery amounted to $4.55 and $5.34 per acre on the respective groups of farms. This difference of 79 cents per acre accounted for $185.33 in the differences in net incomes of the two groups of farms.

Efficiency of Man Labor - The total labor cost, including the operator's and family labor at hired man rates, was $6.97 per acre on the 30 more profitable farms and $7.20 on the less profitable ones. This difference of 23 cents per acre applied to the average size of all farms amounts to only $53.96. This small difference is more significant when one realizes that the returns were nearly twice as high on the more profitable farms.

Amount of Livestock - The more profitable farms fed $11.41 worth of feed per acre, valued at farm prices, while $11.16 worth of feed per acre was fed on the less profitable farms. As an average of all farms, for each $100 worth of feed fed there were livestock returns of $141.97; that is, the product from $100 worth of feed fed on the farm was worth $41.97 more than the farm price of the feed. This difference applied to the additional 25 cents worth of feed per acre used on the more profitable farms accounts for $24.62 of the total difference between the two groups.

Ordinarily, differences in amounts of livestock kept or fed, causes more of the difference in incomes between the most profitable and the least profitable groups of farms than was true with these farms in 1928. For instance, the summary Report of the Farm Bureau-Farm Management Service for the three years of 1925, 1926 and 1927 shows that approximately $660 difference in the incomes between the one-fifth most profitable and the one-fifth least profitable of the farms was due to differences in the amounts of livestock kept and fed.

Prices of Products - No analysis of the differences in incomes due to differences in prices received for products was made in preparing this report. However, it was evident to those working on the records that a comparatively small part of the total difference was due to this factor. It may be noted that the average returns per 100 pounds of pork produced was $9.38 on the one-fifth most profitable and $9.03 on the one-fifth least profitable farms. (See Table 2) This difference of 35 cents per 100 pounds applied to the 17,833 pounds produced on the average of all farms would account for only $62.42. On the other hand the difference due to the difference in feed cost of $1.73 per hundred pounds of pork would account for $308.51 differences in income, or about five times as great as the difference due to prices received.

Table 1 - SUMMARY OF THE YEAR'S FARM BUSINESS

Item	Your farm	Average of 150 farms	Thirty most profitable farms	Thirty least profitable farms
Capital Investments - Total	$81,835.65	$50 058.02	$53 294.51	$49 524.45
Land	60,900.00	44 450.07	44 110.75	36 293.00
Farm improvements	7584.00	5 837.38	4 959.47	5 458.41
Machinery and equipment	3045.50	2 001.28	1 920.66	1 941.12
Feed, grain and supplies	5526.90	3 564.31	3 889.07	2 731.51
Livestock - Total	4779.25	3 204.98	3 414.56	3 100.41
Horses	970.00	746.58	702.55	720.82
Cattle	2965.00	1 144.47	1 311.98	1 172.25
Hogs	548.00	955.35	965.42	916.50
Sheep	—	161.17	207.13	111.37
Poultry	296.25	177.89	155.05	161.20
Bees	—	19.52	72.43	18.27
Receipts - Net Increases - Total	$8618.22	$ 6 534.36	$ 8 031.99	$ 4 153.01
Farm improvements	—	---	---	---
Feed, grain and supplies	3818.58	3 321.89	4 126.22	1 503.46
Labor off the farm	77.50	75.78	87.82	76.42
Miscellaneous	21.00	9.48	3.40	9.61
Livestock - Total		3 127.71	3 814.55	2 563.52
Horses	185.00	5.30	6.54	---
Cattle	1875.25	670.11	802.95	632.11
Hogs	1600.02	1 565.90	1 875.55	1 140.30
Sheep	307.22	109.78	97.64	70.41
Poultry	—	137.02	196.92	153.24
Egg sales	171.65	167.57	178.72	148.74
Dairy sales	562.00	469.47	640.38	418.72
Bees		2.56	15.35	---
Expenses - Net Decreases - Total	$3000.91	$ 2 253.22	$ 2 185.24	$ 2 094.49
Farm improvements	385.80	297.02	256.77	295.96
Machinery and equipment	1059.99	518.54	443.83	501.06
Feed, grain and supplies	—	---	---	---
Misc. livestock expense	11.73	46.85	51.59	51.96
Miscellaneous crop expense	436.59	266.51	255.20	233.24
Hired labor	500.00	612.30	696.45	490.37
Taxes, insurance, etc.	474.46	460.35	431.20	434.94
Miscellaneous expenses	54.17	51.35	45.20	75.90
Horses - decreases	—	---	---	7.95
Miscellaneous livestock decreases Poultry	78.17	---	---	3.11
Receipts less expenses	$5617.31	$ 4 281.64	$ 5 846.75	$ 2 058.52
Total unpaid labor	1500.00	937.45	899.70	985.28
Operator's labor	720.00	692.83	705.00	686.50
Family labor	780.00	244.62	194.70	298.78
Net income from investment and management	4117.31	3 344.19	4 947.05	1 073.24
Rate earned on investment	5.03%	5.66%	8.48%	2.17%
Income left before paying for operator's labor	4837.31	4 037.02	5 652.05	1 759.74
5 percent of Capital Invested	4091.78	2 952.95	2 914.73	2 476.22
Labor and Management wage	$ 745.53	$ 1 084.07	$ 2 737.32	$ - 716.48

Table 2 - IMPORTANT FACTORS BY WHICH THE FARM BUSINESS MAY BE STUDIED
Underlined factors are the ones used on the chart, Page 3

Item	Your farm	Average of 150 farms	30 most profitable farms	30 least profitable farms
Gross receipts per acre	$ 29.72	$ 27.86	$ 35.09	$ 20.25
Total expense per acre	15.52	13.60	13.45	15.02
Net receipts per acre	14.20	14.26	21.61	5.23
Size of farm	290.0	234.6	228.9	205.1
Total investments per acre	$ 282.19	$251.74	$254.67	$241.49
Land	210.00	189.47	192.71	176.97
Farm improvements	26.16	24.86	21.66	26.62
Machinery and equipment	10.50	8.53	8.39	9.47
Feed, grain and supplies	19.06	15.20	16.99	13.32
Horses	3.34	3.18	3.07	3.51
× Productive livestock	13.13	10.48	11.85	11.60
Percent of farm tillable	96.0	90.0	91.4	85.4
Percent of tillable land in Higher profit plus one-half medium profit crops	64.8	68.4	71.5	66.5
Higher profit crops	53.7	60.8	63.4	58.1
Corn	38.1	46.2	47.6	43.5
Wheat	3.6	4.7	4.1	3.4
Alfalfa	3.2	3.0	3.1	1.3
Sweet clover	—	5.1	5.0	3.6
Canning and truck crops	8.8	1.8	3.6	1.3
Medium profit crops	22.3	15.1	16.2	16.8
Barley	3.6	4.2	4.8	3.9
Soybeans	7.2	2.9	1.8	4.7
Spring wheat	—	2.7	3.2	1.9
Clover	—	.5	.2	.6
Clover and timothy mixed	11.5	2.1	2.6	1.9
Miscellaneous	—	2.7	3.6	3.8
Lower profit crops	24.0	24.1	20.4	25.1
Oats	20.4	19.4	16.0	20.9
Timothy	—	1.6	2.1	1.4
Bluegrass	3.6	3.1	2.3	2.8
All legumes	15.2	15.0	15.2	17.9
All crops	90.3	88.7	89.9	87.6

1419.7
116.3.7
25.60

Table 2 - (Continued)

Item	Your farm	Average of 150 farms	30 most profitable farms	30 least profitable farms
Acres of grain crops per farm				
Corn	106	97.6	99.4	76.2
Oats	57	41.1	33.2	36.6
Winter wheat	10	9.9	8.5	6.0
Spring wheat	-	5.7	6.6	3.4
Barley	10	8.8	10.1	6.8
Soybeans - grain and hay	20	6.1	3.7	8.2
Bushels per acre of grain crops				
Corn	57.2	53.0	58.8	47.0
Oats	47.6	43.8	48.4	42.3
Winter wheat	29.0	18.4	23.5	11.8
Spring wheat	-	21.3	26.2	21.2
Barley	30.0	29.7	33.7	25.4
Soybeans	17.5	19.1	14.9	16.1
Productive livestock				
Average investment per acre	$ 12.80	$ 10.84	$ 11.69	$ 11.60
Total returns per acre	17.48	14.68	18.04	14.01
Feed used per acre	15.02	10.34	11.41	11.16
Feed to all productive livestock*	4355.95 ~~4355.95~~	$2424.92	$2612.16	$2239.56
Beef cattle	2336.80	1532.85	989.43	1612.98
Mixed cattle	-	700.05	1152.73	599.90
Dairy cattle	-	788.06	722.47	833.17
Hogs	1434.75	1294.67	1401.58	1127.76
Sheep	303.50	208.63	161.95	116.79
Poultry	280.90	161.05	180.04	169.93
Returns per $100 feed fed to all Productive livestock	$ 116.37	$ 141.97	$ 158.10	$ 125.50
Beef cattle	115.97	132.59	177.86	115.14
Mixed cattle	-	152.23	159.92	143.63
Dairy cattle	-	150.57	174.15	138.16
Hogs	125.18	127.01	139.21	106.56
Sheep	101.23	149.59	150.59	130.42
Poultry	91.11	240.59	252.44	224.31
Returns per $100 invested in all productive livestock	$ 135.82	$ 135.42	$ 154.32	$ 120.78
Poultry	110.02	211.60	256.49	226.86
Pounds of pork produced - total	19900	17 833.0	20 793.2	13 309.4
Pounds of pork produced per acre	68.6	76.0	90.9	64.9
Feed cost per 100 pounds of pork	$ 7.21	$ 7.26	$ 6.74	$ 8.47
Returns per 100 pounds of pork	$ 9.03	$ 9.19	$ 9.38	$ 9.03
Average number of hens kept	230	116.8	107.0	111.4
Number of eggs per hen	50.4	92.5	106.0	86.5

*The average amounts of feed per farm for each class of livestock are averages for only the farms which had the kind of livestock indicated.

65.00

£455.00

925
455
470

925
280
645
180
465

.70 - 1.00

.30

65
7
455.00

55
.50

16.50

Table 2 - (Concluded)

Item	Your farm	Average of 150 farms	30 most profitable farms	30 least profitable farms
Labor, Power and Machinery Studies				
Percent of farms				
With tractors	Yes	78.7	76.7	76.7
With trucks	No	36.7	30.0	33.3
With tractors and trucks	—	31.3	26.7	26.7
Without tractors or trucks	—	16.0	20.0	16.6
Average acres in crops	251.5	187.3	187.9	153.4
Average number of men	3.0	1.96	1.95	1.92
Crop acres per man	83.8	95.6	96.4	79.9
Labor cost per crop acre	7.95	$ 8.27	$ 8.49	$ 9.62
*Labor efficiency index	109.2	100.0	100.7	90.7
Average number of workable horses	9.0	6.93	6.58	6.36
Crop acres per horse	27.7	27.0	28.6	24.1
Value of feed fed to horses	$ 925.45	$524.35	$494.51	$500.48
Feed cost per workable horse	102.83	75.66	75.15	78.69
Horse feed and depreciation per crop acre	2.94	2.77	2.60	3.31
Machinery cost per crop acre	4.22	2.77	2.39	3.27
Horse and machinery cost per crop acre	7.16	5.54	4.99	6.58
*Horse and machinery efficiency index	76.7	100.0	115.6	91.0
Labor plus horse and machinery cost per crop acre	15.11	$ 13.81	$ 13.48	$ 16.20
Expense per $100 gross income	$52.22	$ 48.83	$ 38.41	$ 74.16
Expenses per acre of farm	15.52	13.60	13.48	15.02
Farm improvements	1.33	1.27	1.12	1.44
Horses - decreases	—	-	-	.04
Misc. livestock - decreases	.27	-	-	.02
Machinery and equipment	3.65	2.21	1.96	2.44
Feed, grain and supplies	—	-	-	-
Miscellaneous livestock expense	.04	.20	.23	.25
Miscellaneous crop expense	1.51	1.14	1.12	1.14
Hired and home labor	6.90	6.60	6.97	7.20
Taxes, insurance, etc.	1.64	1.96	1.88	2.12
Miscellaneous	18	.22	.20	.37
Family living furnished by farm				
Farm produce used in home	$ 762.55	$395.95	$418.73	$375.68
House rent (10% of value)	925.	496.42	468.20	521.93
Total living furnished by farm	1687.55	892.37	886.93	897.61
Number in family	9	4.9	4.4	4.7
Farm produce used per person	~~184~~ 84.73	80.31	95.16	79.93

*The "labor efficiency index" for any farm is calculated by finding the number of acres of crops worked on that farm with the same labor cost with which 100 acres of crops is worked on the average of farms of the same size and having the same amount of livestock feeding to do. The "horse and machinery efficiency index" is calculated in the same way.

26
43
78
104
1118

23
16
138
23
368

FARM EFFICIENCY CHART

(See page 11 for an explanation of the use of this chart)

Rate earned on investment	Gross income per acre	Bushels per acre: Corn	Bushels per acre: Oats	Bushels per acre: W. Wheat	Percent land in higher profit crops	Feed per acre to productive livestock	Returns per $100 feed to productive livestock: Beef & dairy cattle	Returns per $100 feed to productive livestock: Hogs	Returns per $100 feed to productive livestock: Sheep	Returns per $100 feed to productive livestock: Poultry*	Returns per $100 feed to productive livestock: All productive livestock	Labor efficiency	Horse and machinery efficiency	Expense per $100 gross income	Size of farm
12.0	48	75	65	32	100	30	250	240	300	460	260	150	180	30	500
7.4	34	60	51	29	77	15	180	157	270	273	181	116	130	41	308
6.2	30	57	48	21	71	11	142	138	191	222	159	109	108	46	290
5.7	28	53	44	18	68	10	132	127	150	212	142	100	100	49	235
5.3	27	50	40	14	67	8	118	125	133	194	138	93	91	51	200
5.0					65		116							52	
3.8	23	46	36	8	61	5	97	112	111	159	123	81	77	63	160
									101		116				
										110					
0.0	12	30	20	4	30	0	60	60	80	60	80	50	50	100	50

*Returns for $100 invested used for poultry.

Explanation of the Farm Efficiency Chart
(See Chart on page 10)

While the farm efficiency chart used in this year's report is more complicated than those used in former years, it will enable cooperators to see more clearly the relative efficiency with which different parts of the farm business are handled. If the following things regarding the plan of the chart are understood its use will not be difficult.

The figure in any column just above the double line across the middle of the chart is the average for all the farms to which that factor applies.

The figure in any column just above the top single line across the chart represents approximately the most efficient farm in the factor named at the top of that column. The figure at the bottom of each column of the chart represents approximately the least efficient farm in that factor.

The figure in any column just above the second from the bottom line across the chart represents approximately the most efficient of the one-fifth of the farms which are lowest in that factor. It also represents approximately the least efficient in the next to the lowest one-fifth of the farms in that factor.

Likewise, the figure in any column just above the next to the top line across the chart represents approximately the least efficient of the one-fifth best farms in that factor. It also represents approximately the most efficient of the second to the best one-fifth group of the farms in that factor. The other lines separate the middle group in each factor from the groups next to it.

By drawing a line across each column at approximately the place which represents the efficiency of his farm in each factor and then, by filling in with a colored crayon or pencil the space below such lines, a cooperator can see more clearly where his farm stands in efficiency in each factor than was provided for the charts used in former years.

COMPARISON OF FOUR YEARS' RECORDS

A comparison of income, investment and efficiency factors for all farms included in each of the four annual reports of the Farm Bureau-Farm Management Service is shown in Table 3, page 12. Most of those who dropped out of the project in 1926 and 1927 were men who stopped farming. However, many of those dropping out in 1928 were among those whose farms proved to be unprofitable. This situation should be taken into account in studying these comparative records.

It may well be noted that the total expense remained fairly constant at about $13.50 per acre. However, the gross receipts varied from $20.74 per acre in 1926 to $27.86 per acre in 1928. These differences were due largely to differences in price levels, yields and quality of crops produced. There seems to have been some increase in the incomes from dairy and poultry products. An increase in the pounds of pork produced per acre indicates an increase in the size of the hog enterprise.

It is apparent that there has been a decided shift from less of the low profit crops to more of the medium profit crops. Much of this shift has been from oats to barley, spring wheat and soybeans. There seems to be some decrease in the labor cost per acre and also in the horse power and machinery cost. The other expenses, consisting mostly of repairs and depreciation on buildings and fences, taxes and miscellaneous crop and livestock expenses, have remained about constant.

Table 3 - Comparison of Four Years' Records

Items	1925	1926	1927	1928
Number of farm records used	225	210	200	150
Rate earned on investment	3.21	2.80	3.72	5.66
Labor and management wage	$-382.00	$-616.00	$ -46.00	$1084.07
Size of farms in acres	232.0	232.1	231.5	234.6
Value of land per acre	$ 191.55	$ 192.24	$ 192.84	$ 189.47
Total investment per acre	258.15	255.93	253.81	251.74
Gross receipts per acre	22.05	20.74	22.78	27.86
Total expense per acre	13.77	13.57	13.33	13.60
Net receipts per acre	8.28	7.17	9.45	14.26
Receipts and Net Increases - Total per farm	$5115.00	$4813.00	$5274.00	$6534.86
Grain less feeds purchased	1901.00	1961.00	2683.00	3321.89
Miscellaneous	105.00	69.00	75.00	85.26
Livestock - total	3109.00	2783.00	2516.00	3127.71
Horses	-	-	5.00	5.30
Cattle	557.00	454.00	562.00	670.11
Dairy products	346.00	353.00	380.00	469.47
Hogs	1845.00	1689.00	1247.00	1565.90
Sheep	101.00	32.00	67.00	109.78
Poultry	118.00	121.00	110.00	137.02
Eggs	137.00	130.00	140.00	167.57
Bees	5.00	4.00	5.00	2.56
Productive Livestock Records				
Investment per acre	$ 9.62	$ 10.43	$ 10.28	$ 10.84
Returns per acre	13.29	13.38	10.85	14.68
Feed used per acre	8.81	8.38	8.06	10.34
Returns per $100 feed used	150.77	159.70	134.57	141.97
Pounds of pork produced per acre	66.8	64.0	74.0	76.0
Bushels per Acre of Crops				
Corn	55.3	51.3	42.0	53.0
Oats	39.2	37.1	34.5	43.8
Winter wheat	18.3	20.6	16.8	18.4
Percent of Tillable Land in				
Higher profit crops	58.2	60.1	59.9	60.8
Medium profit crops	9.8	7.4	13.2	15.1
Lower profit crops	32.0	32.5	26.9	24.1
Expenses per Acre of Farm				
Hired and home labor	$ 6.85	$ 6.67	$ 6.58	$ 6.60
Horse power and machinery	4.80	4.42	4.38	4.42
Other expenses	4.71	4.79	4.73	4.79
Farm produce used in farm home	$ 430.21	$ 466.70	$ 439.15	$ 395.95

ORGANIZATION AND PURPOSE OF THE FARM BUREAU-FARM MANAGEMENT SERVICE

The Farm Bureau-Farm Management Service Project was organized during the latter part of 1924. Its purpose is to assist the cooperating farmers to keep such farm accounts as will enable them to study the efficiency with which they are conducting their farm business and to apply to their individual farms the practices in farm organization and operation which have proved profitable on other farms of a similar type. The cooperators in the project are farm bureau members of Livingston, McLean, Tazewell, and Woodford counties. The project is an outgrowth of the regular farm management extension work begun in Tazewell county in 1915. Some work was done in all of the four counties in 1916.

In Woodford county from 30 to 100 farmers completed farm accounts each year from 1916 to 1921 and beginning in 1921 over 100 records have been closed annually. Farm management tours have played an important part in developing interest in the work. The growing number of farmers keeping records made it impossible for the College of Agriculture to give thru the regular extension work the assistance desired by the farmers. This situation led to the organization of the Farm Bureau-Farm Management Service.

About sixty farm bureau members in each of the four counties cooperated in the project for the three years of 1925, 1926 and 1927. About three-fourths of them continued during 1928 while an analysis of the records secured during the first three years was made. Beginning the latter part of 1928, the project was reorganized for the three-year period of 1929 to 1931 with about 400 farm bureau members who are quite evenly distributed in the same four counties. About three-fourths of the original cooperators continued in the service. The total annual cost is approximately $35 per farm per year. About one-half of the expense is borne by the University of Illinois. This leaves a cost of about $17.50 per farm per year. The fee varies from $12.50 to $25 per year, depending on the size of the farm. In two of the counties, the Farm Bureaus pay a portion of each fee, while in two counties the cooperators pay the entire fee.

As the work is now organized with over 400 cooperating farmers, M. L. Mosher gives the greater part of his time to the preparation of reports and supervision of the work. J. B. Andrews, who assisted with the field work in 1928, is doing the field work in McLean and Tazewell counties. W. A. Herrington, formerly farm adviser in Stephenson county, Illinois, is field man in Livingston and Woodford counties. Each cooperator is being visited on his farm from four to six times during each year. The work is under the direction of H. C. M. Case, in charge of the Department of Farm Organization and Management, acting in cooperation with an advisory committee consisting of one representative of each farm bureau. This committee consists of G. F. Bennett, Livingston county, chairman, Dubois Marquis, McLean county, W. C. Somer, Tazewell county, and J. Frank Felter, Woodford county, who is secretary-treasurer. This committee is responsible to the cooperating farm bureaus for the custody and expenditure of the funds raised by the collection of the cooperator's fees. Each farm bureau collects the fees from its cooperating members and pays them over to the committee.

The organization of the project was made possible by the hearty support and assistance of the four Farm Advisers and their assistants. The Farm Advisers who cooperated in the reorganization were H. O. Allison, Livingston county, Wilbur H. Coultas, McLean county, Ralph E. Arnett, Tazewell county, and H. A. deWerff, Woodford county.

The following discussion entitled

A BUDGET FOR THE FARM BUSINESS

is a part of the report sent to all farmers in Illinois who have cooperated in keeping farm accounts with the University of Illinois and their local county farm bureaus. Farm bureaus in 83 counties are cooperating in the work and reports from the farm advisers indicate that approximately 3000 farmers are enrolled in the project this year. The records kept by farmers not included in the Farm Bureau-Farm Management Service are not closely supervised during the year and provide for a much less complete analysis of the farm business. Acknowledgment is made here to R. R. Hudelson of the Department of Farm Organization and Management for his contribution in the preparation of the following discussion.

A Budget for the Farm Business

The practice of budgeting is now accepted as necessary to good management in nearly all lines of commerce and industry as well as in government. It can be and in a few cases has been successfully applied to farming. A budget is a plan for using or spending the resources of the business. On the farm these resources include land, labor, power, equipment, seed, feed, livestock, and cash or credit. The budget may consist of a plan for several years ahead or it may be for only one year. As a rule there should be both a general plan for several years and a more definite budget for the next year.

Some folks are likely to say that there is no use in a budget for the farm business because changes in weather and prices will make it impossible to follow a definite plan. It is true, of course, that conditions will arise which make it necessary to substitute one crop for another when the planned crop fails or to supply more labor or power when wet spells keep men and teams out of the fields for days during the rush season. The price outlook, too, may change from what was expected and make it advisable to feed the hogs to lighter or heavier weights, or to sell grain at a different time.

These changes, however, do not destroy the value of a definite plan. They do make it necessary to plan substitute crops and substitute ways of doing the work when adverse weather conditions are met. Most other industries have less disturbances from weather but they do have strikes, changes in price, and uncertain factors which frequently make it necessary to modify plans. Few, if any, businesses are so blessed with stable conditions that a year's work can be laid out in the form of a budget and allowed to run without change. These unexpected changes make it impossible to run business entirely by rule. Business on the farm or anywhere else probably will always require the constant supervision of men of good judgment to meet the ever-changing conditions as they appear.

Actual accounts from hundreds of farms scattered all over the state have shown year after year that those farms which stand out as successful during this period of "hard times" are farms whose operators have been following definite, well thought out plans. Hit or miss operation without plan or system seems doomed to failure under present conditions.

How then can a farm operator go about the job of making plans and budgets? Winter is the best time of year to plan. Evenings are long and outside work is not so pressing. The day's work still leaves enough energy for thought. First there should be a long-time general plan as to what kinds of crops and livestock to produce. The "Farm Business Reports" for 1927 included a detailed discussion of the main considerations in selecting a cropping system. The same series of reports for 1928 discussed other factors involved in making a long-time plan for the farm with a list of the factors which bring success. These discussions cannot be repeated here for lack of space.

The successful farm operator usually has a plan for soil improvement. It may cover a period of years and be very simple, but as the years roll by his yields are maintained or improved. He has a definite cropping plan which he follows as closely as weather conditions will permit. In case a crop fails he knows in advance what he will substitute for it to avoid disrupting his plans for feed, labor, soil improvement, and equipment. The substitute crop should provide also for getting back to the regular, planned rotation as quickly as possible. It takes determination to stick to a crop rotation, but it pays in the long run as proved on a large number of successful farms. The cropping plan should be selected

with due consideration of the kinds of livestock to be kept. The numbers of livestock should be adjusted to the available feeds, the labor supply, and the markets. The entire long-time plan should avoid waste of resources of the farm business, especially labor, which is the largest single item of operating cost.

With the long-time plan recorded, the farm operator is ready to draw up a definite budget for the next year. At this point the man who has kept accounts and other farm records is far ahead of the one who has not. Past records are very useful in making future plans. It is necessary, of course, to look into the future in drawing up a plan or budget, but we can look into the future best by knowing the past and modifying past performance in the light of present and prospective conditions.

Budgeting the crops. We may begin by planning the production and disposal of crops. It is assumed that the long-time cropping plan has been made. The first step is to draw a map of the farm for the coming year and to enter on it the crop to be grown and the number of acres in each field. To illustrate this and other steps in making a budget we will use a budget for an actual central Illinois farm. This farm is especially well organized and its operator has kept accounts for several years. The accounts have shown it to be much more successful than the average farm. Page 13 shows a map of this farm. It contains 200 acres, has a five-year rotation of corn, corn, oats, wheat, and clover, and all main fields except one contain 40 acres each. Besides a good crop rotation the soil plan has included the application of some rock phosphate. The livestock enterprises consist of 10 to 15 Shorthorn cows kept to produce calves and milk, 10 to 12 brood sows which farrow two litters a year, and a small flock of about 115 hens. The power supply includes 4 to 6 brood mares and a small tractor. As shown on the map, part of the clover field is fenced off for hay each year, using a temporary fence.

The second step is to prepare a form such as shown on page 19. Here are listed the acreage, yield, total production, and carry-over of crops. This budget is made as of January 1 and the carry-over is the same as the January 1 inventory. The estimate of yield is made on the basis of the average yields on this farm for the last four years. In this case slightly less than the average figure was used in order to be conservative and avoid disappointments. The man who has kept no record of yields will have to draw on his memory or upon average figures for his locality. For these and for other average figures needed in making a budget the tables showing average yield, income, expense, and investment figures on farms keeping accounts may be taken from the foregoing tables in this report, pages 6 to 9. The production and carry-over together give the amounts of crops available for seed, feed, sale and carry-over for the next year. Seed requirements can easily be estimated when the proposed acreage of each crop is known. This is as far as we may go in crop disposal until the budget for feeds is made.

Budgeting Feeds. The third step is the making of a feed budget. The form for this is shown on page 20. We first list the numbers of livestock on hand, keeping in mind our estimate of the numbers to be born. This estimate is based on previous experience and market outlook. We also plan the method of feeding and the length of feeding periods. With these plans made we are ready to estimate the kinds and amounts of feed needed for the year.

Many farm operators have neglected estimating their feed requirements in advance because of the difficulties involved in knowing quantities of feed needed by different kinds of livestock fed or pastured under different conditions. As a result of making no definite estimate the feed supply often runs short, feed has

to be purchased on an emergency basis, or the livestock have to be kept on short unprofitable rations, or sold on an unsuitable market.

To estimate the quantities of feeds needed, some tables of feed requirements for different kinds of livestock under different conditions are helpful. No tables that are entirely adequate are available at present but some partial tables based on accounts and feed records on Illinois farms were included in the "Farm Business Reports" for 1928. These are repeated on pages 24 and 25 of this report.

With the numbers and plans for livestock known and with feed requirement tables we can estimate the quantities of different kinds of feed needed for each class of livestock as shown on page 20. It is best to include here quantities of feeds to be bought as well as quantities of home-grown feeds, since each depends upon the other. The best tables of feed requirements for any particular farm can be made by keeping records or careful estimates of feeds used each year for each kind of livestock and basing future plans on past experience.

With the tables of feeds made out as shown on page 20 we are ready to complete the table of crops, page 19. We have entered here the totals of each crop needed for feed. On this particular farm the practice is followed of carrying over a liberal supply of feed into the next year and the quantities to be carried over for 1930 have been included in the table. If it were expected that any particular feed would run out before the 1929 crops will be ready we should add the necessary purchase to the columns of purchased feed in the feed table, page 20. Finally, we can enter the quantities of crops to be sold. These quantities are found by subtracting the amounts of crops to be used and carried over from the total amounts of those carried over from the previous year and of those raised in the present year. To get the value of crop sales we must estimate the probable farm price. For use in this budget we have used conservative figures with the expectation that the actual income will be above rather than below our estimates. Price estimates should be based on past experience supplemented by the available information as to world and national supplies on hand, crop prospects in the southern hemisphere and probable demand, especially as influenced by numbers of livestock on hand to consume feed crops. Information of this kind is available about February 15 of each year in the national and state "Outlook Reports." It is brought up to date from time to time in a monthly publication of the U. S. Department of Agriculture called "The Agricultural Situation." Applying the estimated prices to the quantities to be sold we have an estimate of income to be expected from crop sales.

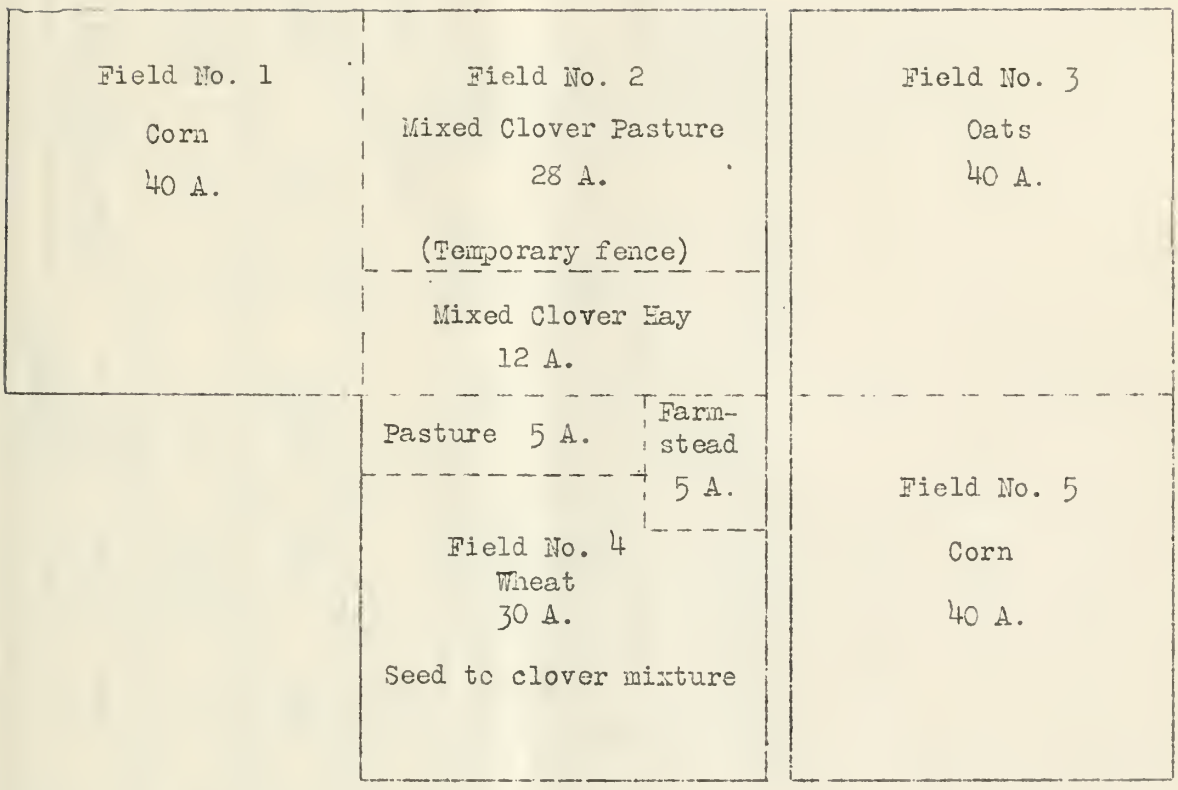
Budgeting Livestock Products. The budget for production and disposal of livestock and livestock products is the fourth step and is next in order. The form is shown on page 21. We have previously estimated the numbers of livestock to be raised and the weights to which they will be fed. We need also to estimate quantities of dairy and poultry products to be produced. Here again past experience is the best guide and records of past production are very valuable. Following this estimate of production there should be an estimate of the quantities of pork, poultry, milk, etc., to be used by the family and hired help. Deducting these amounts there remain the quantities of livestock products which should be available for sale. Again we estimate the probable prices to be received. Here we are guided by a knowledge of seasonal variations in prices of different kinds of livestock products, by a study of price cycles including present and future position within the cycle, by storage holdings of livestock products, and probable demand as influenced by prospective business conditions. This information is also reviewed in the national and state outlook reports and in "The Agricultural Situation." Applying the estimated prices to the quantities to be sold we have an estimate of the gross income from livestock.

Budgeting Income and Expenses. With the budget for crops, feeds, seeds and livestock complete, we are prepared for the fifth step which is to set up the budget of income and expense as shown on page 22. The income figures are taken from the tables of sales of crops and livestock. The expense figures in this case were taken from accounts kept on this particular farm over the past four years. Where no accounts are available most items of expense can be estimated by consulting cancelled checks and other records. The average figures given in the foregoing tables on page 6 will help to suggest the items of expense. In these tables depreciation on improvements and equipment is included, altho it is not an actual cash expense and will not be included in the list of expenses in the budget. The item of crop expense includes purchased seed, and bills for threshing, twine, shelling, etc. When the table of income and expense is complete the expense is subtracted from the estimated gross income. The difference represents the probable income left at the end of the year to cover depreciation, unpaid labor of the operator and his family, interest on the invested capital and compensation for the risk and management involved in operating a business. The item of depreciation must cover the decreasing value of buildings, fences, machinery, limestone, and phosphate previously applied to the land, and mature horses or cows which become less valuable with age. The table on page 23 shows the distribution of income remaining after actual expenses are paid on the particular farm used in making this budget. This table is of interest in bringing out the items necessary to be covered by the farm income if the business is to be profitable as measured by standards commonly accepted in other lines of industry and commerce.

It will often pay to make out budgets for different ways of operating the same farm and estimating the probable net income which may result from these different systems. The different plans may involve different kinds and acreages of crops and different kinds and numbers of livestock. It may be of value also to figure on a basis of different kinds of power and equipment which require different amounts of labor.

The budget should be followed by keeping accounts. Much of the value of any budget will be lost if accounts are not kept which will make it possible to see how closely the business follows the budget. Improvement of future budgets also depends on keeping suitable accounts which give a more accurate basis for future plans. The greatest value of such a budget as we have outlined lies in the fact that it leads to clear thinking at a time when the farm operator is free to think. If substitute plans are included to take care of the most likely emergencies such as failure of wheat or clover crops or the occurrence of wet weather in rush seasons, the operator will have less need to depend on snap judgments.

Crop Map for 1929



Crop Plan for Future

Field 1	Field 2	Field 3	Field 4	Field 5
Oats 1930	Corn 1930	Wheat 1930	Clover 1930	Corn 1930
Wheat 1931	Corn 1931	Clover 1931	Corn 1931	Oats 1931
Clover 1932	Oats 1932	Corn 1932	Corn 1932	Wheat 1932
Corn 1933	Wheat 1933	Corn 1933	Oats 1933	Clover 1933
Corn 1934	Clover 1934	Oats 1934	Wheat 1934	Corn 1934

PROBABLE PRODUCTION AND DISPOSAL OF CROPS

(All quantities expressed in bushels or tons)

Crops	Acres	Yield	Production	Carry-over from 1928	Total available	Disposal				
						Seed	Feed	Carry-over to 1930	Sales	
									Quantity	Value
Corn	80	60	4800	3000	7800	15	3130	3000	1655	$1241.25
Oats	40	50	2000	1000	3000	100	930	1000	970	339.50
Wheat	30	25	750	-	750	50	-		700	770.00
Hay (mixed)	12	2	24	20	44	-	22	22	-	
Oat straw	40	3/4	30	40	70	-	40	30	-	
Total expected crop sales										$2350.75

Estimated Feed for Livestock

Livestock	Home-grown feeds		Purchased feeds		
Kind and numbers	Kind	Amount, bushels or tons	Kind	Amount (pounds)	Cost
Horses	Corn	-			
4 mature	Oats	500			
3 colts	Hay	5			
	Straw	10			
Cattle					
10 cows and spring calves	Corn	550	Cotton-seed	3500	$100
7 calves of 1928	Oats	200		1000	19
10 yearlings	Hay	17	Bran		
	Straw	30			
Hogs					
12 sows with spring and fall litters	Corn	2500	Tankage	2000	37
	Oats	200	Oilmeal	2000	65
60 fall pigs of 1928			Alfalfa meal	2000	45
Chickens					
110 hens	Corn	80	Tankage	400	18
200 chicks	Oats	30	Shorts	1000	20
Total expected feed purchases					$354

Probable Production and Disposal of Livestock and Livestock Products

Livestock products	Production*	Disposal		
		Used in home	Sales	
			Quantity	Value
Beef.	10,000 lbs.	-	10,000 lbs.	$1200
Pork.	31,500 "	1,500 lbs.	30,000 "	2700
Butterfat (including milk and cream) .	1,850 "	200 "	1,650 "	660
Eggs.	1,500 doz.	200 doz.	1,300 doz.	260
Poultry	600 lbs.	150 lbs.	450 lbs.	115
Total expected income from livestock				$4935

*If colts are raised and sold they should be included.

Probable Receipts and Expenses

Receipts		Expenses	
Crops	$2,350	Seed	$ 75
Livestock	4,935	Other crop expense (Twine, threshing, shelling, etc.)	100
		Feed	310
		Other livestock expense (Serum, veterinary, medicine, etc.)	50
		Hired labor	650
		Equipment, repairs, and supplies, including gas and oil	225
		New machinery	50
		Improvement repairs (Paint, fence repair, etc.)	50
		Improvements, new (Buildings, fence, limestone, phosphate)	75
		Taxes	325
		Insurance	15
		Interest	-
		Total expenses	$1925
		Income less expenses	5360
	$7,285		$7285

Distribution of Income

(This is not a part of the budget, but shows the items to be covered by the income left after actual expense is paid.)

Items to be covered by income remaining after cash expense is paid		Amount
Gross income less expense.		$5 360
Depreciation (based on beginning inventory)		
Horses 10% after 9 years of age . . $ 55		
Buildings 2%. 192		
Fencing 10% less repairs. 64		
Phosphate 10% 75		
Total depreciation	$ 386	
Labor not paid		
Operator. $720		
Other members of family 300		
Total unpaid labor	1 020	
Total expense not included in budget	$1 406	
Net operating income to cover investment and management.		3 954
Capital returns, 5% on $58 000	2 900	
Amount remaining as pay for management and risk. .		1 054

Table of Feed Requirements -- Farm Conditions

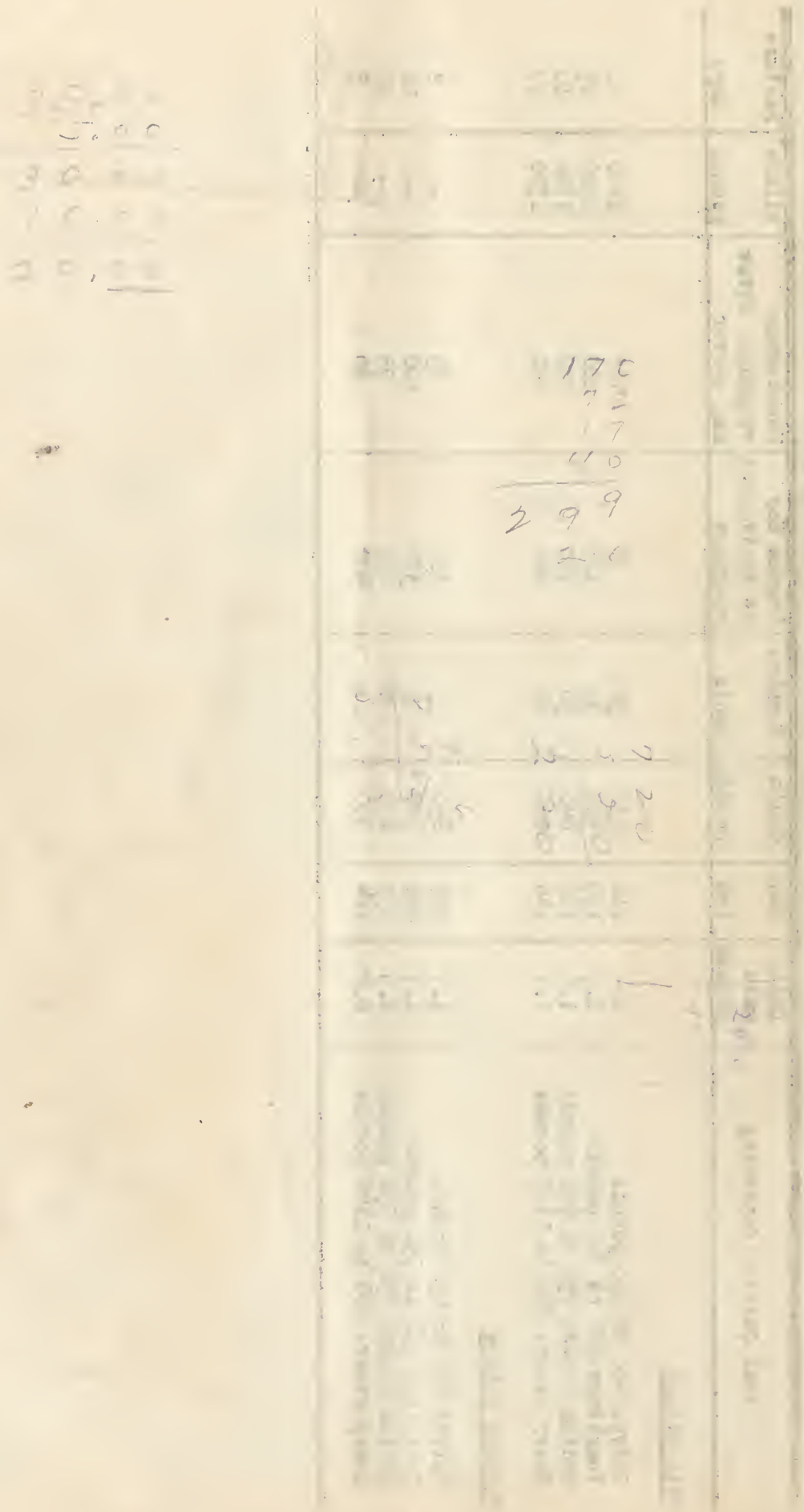
(Amounts given are per head, per year except as indicated otherwise)

Class of livestock	Grain pounds	Supplements	Legume hay or equivalent roughage	Non-legume roughage, straw and stover	Silage pounds	Pasture days
Work Horses						
Champaign-Piatt Counties 1920-1926	2650		1800	1900		175
Knox-Warren Counties 1923-1925	2750		2500	1750		130
Yearlings - grade colts	1000		2000	1500		200
Dairy Cattle (dairy cost records 1926)						
5000 lb. production	1100	500	1700	1200	5000	150
7000 lb. production	1600	550	1900	700	6700	150
9000 lb. production	1800	800	2300	300	7400	150
Hogs Breeding Herd (McLean Co. 1924-1926)						
Brood sow (per year)	1400	80				Pasture
Breeding herd and pigs per 100 lbs. gain	460	25				in
Fattening pigs after weaning per 100 lbs. gain	435	23				season
Beef Cattle - Herd (with silage)	(Cow and calf					
Cow	may easily		300-1000	1500	5000	180
Calf 6 months after weaning	use 500-1000		700-900	500	2500	
Yearling stocker	lbs. grain)		800	1000	3500	180
Sheep						
(1) Ewe (without silage)	125		300			Pasture
(2) Ewe (with silage)	150		150		300	in season
Lambs on full feed per 100 lbs. gain						
(25 lbs. gain per lamb)	400		500			
Poultry						
Laying flock (per 100 hens per year)	5400	600				
Pullets to 5 months of age						
Egg breeds (100 hen basis)	1800	200				
American breeds (100 hen basis)	2250	250				

Table of Feed Requirements -- Farm Conditions

(Amounts per 100 pounds gain, dry lot conditions)

Beef Cattle, fattening	Daily gain pounds	Days fed	Grain pounds	Supplements	Legume hay or equivalent roughage	Non-legume roughage, straw and stover	Silage pounds	Pasture days
With Silage								
Calves 400 to 550 pounds	1.4	212	430	30	75	125	1400	10
Yearlings 550 to 750 pounds	1.5	199	460	35	125	200	1500	15
Medium steers 750 to 950 pounds	1.5	166	640	50	150	230	1700	10
Heavy steers 950 to 1100 pounds	1.7	146	825	45	200	250	1300	10
Without Silage								
Calves 400 to 550 pounds	1.7	209	650	5	300	85	--	8
Yearlings 550 to 750 pounds	1.7	219	700	5	370	100	--	18
Medium steers 750 to 950 pounds	1.9	155	875	5	400	95	--	12
Heavy steers 950 to 1100 pounds	2.2	124	950	10	400	80	--	5



Fifth Annual Report

of the cooperators in the

Farm Bureau-Farm Management Service

for the year 1929

M. L. Mosher, J. B. Andrews, W. A. Herrington, H. C. M. Case

Illinois farmers had about the same average net earnings in 1929 as in 1928 according to present available information based on figures from a part of the nineteen hundred farm accounts completed in the Illinois farm account projects last year. As pay for management, risk and use of capital the final computation of rate earned on total invested capital on Illinois farms for 1928 was 2.9 percent. No satisfactory method is known for valuing management of farms but if one percent on the investment be considered as pay for management there remained 1.9 percent for the risk and use of capital invested. Based on the average of all farms in the Illinois farm account projects for the 5 years 1924 to 1928 one percent of the capital invested has been equivalent to 8.5 percent of the gross income.

The farm earnings given above represent the average for the rank and file of farmers. Repeated studies of earnings on all farms in typical areas have shown that the average earnings for all farms are lower than for farms included in the farm accounting projects. Allowance has been made for this fact. The difference has been found to be consistently about 2 percent of the investment in favor of the account keepers. For this reason the following figures for the cooperators in the Farm Bureau-Farm Management Service should not be taken to represent average farm earnings for that area. It is probable that earnings on the average farm for 1929 were about 2 percent less than for these progressive and businesslike farmers.

The 380 farmers in east central Illinois who kept records in the Farm Bureau-Farm Management Service in Livingston, McLean, Tazewell and Woodford Counties for 1929 earned for the use of capital invested and for the management and risk of operating the business an average of 5.56 percent on their investments. A wage of $60 a month was allowed as pay for the operator's labor, no salary being deducted for management. If we allow one percent of the investment as pay for management, in this case amounting to $560 a farm, there remains a rate of 4.56 percent as pay for the risk and use of capital invested in these record keeping farms. A second method of computing earnings is to deduct 5 percent of the investment as pay for the risk and use of the capital instead of deducting a labor wage for the operator and assume that the remaining income is pay for labor and management. Following this plan it is found that the average farm operator of this group had a labor and management wage of $1003. If it is assumed that the labor performed by the operator is worth $60 a month or $720 a year, there is $283 left as pay for risk and management in doing a gross business of $6185 with an investment of $56,022. The average value of the land included in this report was placed at $184 an acre. Other items including improvements, equipment, livestock and feed made a total investment of $246 an acre. The land and improvements exclusive of the house averaged $209 an acre.

Farm earnings vary widely from year to year owing to differences in weather and markets. The cooperators in this service earned a higher average rate for 1929

than for any other year since the work began in 1925 except for 1928. The earnings for 1929 were low, however, as compared with reported businesses in other industries. Over 1500 companies representing 57 industries are reported by a nationally known bank as having earned 12.8 percent on their net worth for 1929. These companies, unlike farms, pay for management in the form of salaries to officers and executives. Like the farms included in the Illinois farm account projects it is probable that the companies reporting earnings are more successful than the average of all companies in the same industries.

The value of home grown produce used by the farm family is not included in the income figures as stated in this report. The farm products used at home were found to have an average value of $396 at farm prices. (Table 4) This item of produce may be considered as labor income for the farm operator and other members of the family in addition to the labor wages deducted in the accounts.

In analyzing these records the investment in the residence of the operator is left out of the farm inventory. Depreciation and upkeep on the residence also are not included. This is for the same reason that the business man in town does not include the cost of his residence as part of his business. The use of the house is considered an income from an investment outside of the farm business.

Differences in Earnings Between Farms

The usual wide variations in the earnings on the most profitable and the least profitable farms may well be noted (Table 1). The 76 most profitable of the 380 farms made 5 percent on the investment and had an average of $2670 to pay each operator for his own labor and management, while the 76 least profitable farms lacked $567 per farm of making 5 percent on the investment and left nothing to the operator for his own labor and management.

This amounts to a total difference of $3237 per farm per year in the return for the labor and management of the operators between the high and low groups of farms. This may be expressed in another way by saying, after all expenses were paid and the operator allowed $720 for his own labor, the most profitable group made 8.62 percent on the investment, while the least profitable group made only 2.60 percent on the money invested.

The one-fifth most profitable farms (76 farms) had a total income of $33.80 an acre, while the one-fifth least profitable farms had an income of only $20.89 per acre (Table 2). The total expenses per acre with no charge for interest on the investment on the two groups of farms were $13.09 and $14.55 per acre respectively. In other words, the most profitable group of farms with $1.46 less expense per acre received $12.91 larger returns per acre. The same table shows that the least profitable farms were a little smaller in size on the average and that they had a little larger investment per acre.

These differences in farm earnings should not be taken to mean that all the least profitable farms are necessarily operated at present by poor managers or that the plan of farming is open to severe criticism. Many of the farms have been allowed to deteriorate in fertility of land and equipment over a long period of years Some of the most profitable farms, on the other hand, have a background of from ten to fifty years of superior operation from the standpoint of drainage, soil improvement and quality and arrangement of building and fences. Some of the least profit-

able farms are now in the process of being reorganized and built up towards a more profitable basis. The larger percent of tillable land in sweet clover on the one-fifth least profitable than on the most profitable farms indicates that there is a definite tendency for the operators of some of the least profitable farms to be working on the problem of increasing soil fertility. (Table 2). Also there are other indications of improvements being made on many of the farms although the full financial gain cannot be realized for a few years.

Two Opportunities for Increasing Farm Incomes

Farm earnings may be increased through "What the farmer can do for himself" and "What farmers can do in cooperation." While this report deals with the former, the latter means of helping farmers is important. It is concerned with such matters as the adjustment of tariffs, transportation rates and taxes and the handling of seasonal surpluses of agricultural products. These and similar problems require the organized effort of farmers if they are to present their case effectively before legislative and governmental boards and commissions and in conferences with other groups.

Regarding what the farmer can do for himself, that is concerned with the efficiency with which he operates his own farm business. The wide differences in earnings on farms included in this study operated under similar conditions of soil, climate and markets, show that the individuals have a large opportunity of improving their incomes. This can be accomplished through adopting plans for the organization and operation of their farms which have proved most profitable. In fact the earnings on most farms can be increased more through increased efficiency in operation than can be expected through any rational adjustments of tariff, freight rates or taxes or improved handling of seasonal surpluses.

Increased efficiency on the best corn-belt land is justified as a safe means of increasing the farm income as it is the most effective way of reducing the costs of production of each unit of product. Likewise, it will be an effective way of discouraging further expansion of farming to cheap marginal land which should be held out of agricultural production under present conditions.

A careful study of his report by each cooperator will, it is believed, enable him to know rather definitely where he can most readily increase the efficiency of his farm business and how other farmers have more successfully conducted that part of the farm work.

Location of Differences in Incomes Between the More Profitable and the Less Profitable Farms

Most of the difference of approximately $3400 in the average net earnings for each of the 76 most profitable and the 76 least profitable farms is accounted for in Chart 1.

Chart 1. Location of Differences in Incomes Between the 76 Most Profitable and the 76 Least Profitable Farms

Factors considered	The lengths of the shaded bars are in proportion to the amounts of the differences	Average difference
Crop yields	XXXX

less profitable farms. In general, only about one-half of the grain produced on these farms was fed on the farms. As an average of all farms, for each $100 worth of feed fed there were livestock returns of $144, that is, the product from $100 worth of feed fed on the farm was worth $44 more than the farm price of the feed. This difference applied to the additional $1.23 worth of feed per acre used on the more profitable farms accounts for $123 of the total difference between the two groups.

Efficiency of Man Labor--The total labor cost, including the operator's and family labor at hired man rates, was $6.44 per acre on the 76 more profitable farms and $6.93 on the less profitable ones. This difference of 49 cents per acre applied to the average size of all farms amounts to $111.52. This small difference is more significant when one realizes that the returns were nearly twice as high on the more profitable farms.

Miscellaneous Expenses--Expenses other than labor, power and machinery amounted to $4.58 and $5.05 per acre on the respective groups of farms. This difference of 47 cents per acre accounted for $106.97 in the differences in net incomes of the groups of farms.

Prices of Products--No analysis of the differences in incomes due to differences in prices received for products was made in preparing this report. However, it was evident to those working on the records that a comparatively small part of the total difference was due to this factor. It may be noted that the average returns per 100 pounds of pork produced was $10.09 on the one-fifth most profitable and $9.74 on the one-fifth least profitable farms. (Table 2). This difference of 35 cents per 100 pounds applied to the 16,772 pounds produced on the average of all farms would account for only $58.70. On the other hand the difference due to the difference in feed cost of $1.42 per 100 pounds of pork would account for $238.16 differences in income, or about four times as great as the difference due to prices received.

Kind of Crops Grown--There was very little difference between the more and less profitable groups of farms in the proportions of tillable land in the crops which ordinarily are more or less profitable. However, in the case of individual farms, it was apparent that the net incomes for the year were greatly influenced by the proportion of tillable land in crops of corn, wheat, alfalfa, sweet clover and canning crops which have been recognized as the more profitable crops usually grown in the area as compared with the amount of land in oats, timothy and bluegrass. Because of the good yields and unusually high prices, soybeans were more than ordinarily profitable in 1929.

In this connection it is well to note that there has been a marked decrease during the past five years in the acreage of the lower profit crops of oats, timothy and bluegrass as grown on the farms cooperating in this service. (Table 3)

Table 1 - SUMMARY OF THE YEAR'S FARM BUSINESS

Item	Your farm	Average of 380 farms	76 most profitable farms	76 least profitable farms
Capital Investments - Land	$	$41 927	$40 878	$33 206
Farm Improvements		5 600	5 324	5 756
Horses		698	644	679
Cattle		1 239	1 302	1 209
Hogs		780	985	829
Sheep		124	101	80
Bees		8	4	17
Poultry		164	162	153
Livestock - Total		3 013	3 198	2 967
Machinery and equipment		1 875	1 759	1 750
Feed, grain and supplies		3 607	3 718	3 367
Total Investment	$	$56 022	$54 877	$52 046
Receipts-Net Increases				
Horses		----	9	----
Cattle		599	720	693
Hogs		1 579	2 398	1 336
Sheep		68	67	49
Bees		3	2	6
Poultry		133	171	96
Egg sales		179	215	147
Dairy sales		611	782	339
Livestock - Total		3 172	4 364	2 665
Feed, Grain and Supplies		2 936	3 269	1 726
Labor off farm		70	75	53
Miscellaneous receipts		7	8	7
Total Receipts - Net Increases	$	$ 6 185	$ 7 716	$ 4 452
Expenses - Not Decreases				
Farm Improvements		260	219	290
Horses		5	----	20
Miscellaneous livestock decreases		----	----	----
Machinery and equipment		510	472	526
Feed, grain and supplies		----	----	----
Livestock expense		50	56	47
Crop expense		276	295	247
Hired labor		555	605	619
Taxes		446	428	438
Miscellaneous expenses		50	47	56
Total expenses - Net Decreases	$	$ 2 162	$ 2 122	$2 243
Receipts Less Expenses	$	$ 4 023	$ 5 594	$2 209
Total unpaid labor		910	866	858
Operator's labor		691	686	684
Family labor		219	180	174
Net income from investment and management		3 113	4 728	1 351
Rate earned on investment	%	5.56 %	8.62 %	2.60 %
Return to capital and operator's labor and management		3 804	5 414	2 035
5 percent of capital invested		2 801	2 744	2 602
Labor and management wage	$	$ 1 003	$ 2 670	$ -567

Table 2 - IMPORTANT FACTORS BY WHICH THE FARM BUSINESS MAY BE STUDIED
Underlined factors are the ones used on the chart, Page 10

Item	Your farm	Average of 380 farms	76 most profitable farms	76 least profitable farms
Gross receipts per acre	$	$27.17	$33.80	$20.89
Total expense per acre		13.49	13.09	14.55
Net receipts per acre		13.68	20.71	6.34
Size of farm		227.6	228.3	213.1
Total investments per acre	$	$246.12	$240.36	$244.19
Land		184.20	179.04	179.25
Farm improvements		24.60	23.32	27.01
Machinery and equipment		8.24	7.71	8.21
Feed, grain and supplies		15.85	16.28	15.80
Horses		3.06	2.82	3.19
Productive livestock		10.17	11.19	10.73
Percent of farm tillable		89.6	87.1	90.7
Percent of tillable land in higher profit plus one-half medium profit crops		68.3	69.8	69.4
Higher profit crops		61.4	62.0	62.4
Corn		46.0	46.9	45.0
Wheat		7.0	6.4	7.7
Alfalfa		1.9	2.4	2.1
Sweet clover		5.0	4.5	6.3
Canning and truck crops		1.5	1.8	1.3
Medium profit crops		13.9	15.6	14.2
Barley		3.4	3.7	4.2
Soybeans		2.8	2.7	2.9
Spring wheat		1.6	2.3	1.2
Clover		2.2	2.6	2.1
Clover and timothy mixed		3.2	3.5	2.6
Miscellaneous		.7	.8	1.2
Lower profit crops		24.7	22.4	23.4
Oats		20.2	19.7	18.0
Timothy		1.5	.9	1.9
Bluegrass		2.6	1.5	3.1
Miscellaneous		.4	.3	.4
All legumes		15.5	16.3	16.7
All crops		88.7	89.9	87.6
Acres of grain crops per farm				
Corn		93.8	93.3	87.0
Oats		41.3	39.1	34.8
Winter wheat		14.2	12.7	14.8
Spring wheat		3.2	4.7	2.3
Barley		7.1	7.3	8.1
Soybeans - grain and hay		5.8	5.4	5.7

Table 2 - (Continued)

Item	Your farm	Average of 380 farms	76 most profitable farms	76 least profitable farms
Bushels per acre of grain crops				
Corn		46.2	51.5	40.8
Oats		45.3	51.4	42.2
Winter wheat		21.1	22.9	18.9
Spring wheat		20.4	21.9	18.2
Barley		28.3	35.4	21.9
Soybeans		20.2	22.1	16.5
Productive livestock				
Average investment per acre	$	$10.45	$12.00	$10.25
Total returns per acre		15.28	20.41	13.78
Feed used per acre		10.60	12.73	11.50
Feed to all productive livestock	$	$2412	$2907	$2451
Beef cattle*		1906 (53)	1790 (13)	2570 (13)
Mixed cattle		683 (126)	611 (26)	744 (19)
Dairy cattle		787 (190)	937 (34)	540 (42)
Hogs		1267 (353)	1686 (74)	1293 (68)
Sheep		258 (88)	250 (16)	228 (19)
Poultry		187 (352)	202 (70)	183 (69)
Returns per $100 feed fed to all				
Productive livestock	$	$ 144	$ 160	$120
Beef cattle		120 (53)	136 (13)	105 (13)
Mixed cattle		144 (126)	173 (26)	103 (19)
Dairy cattle		166 (190)	195 (34)	140 (42)
Hogs		134 (353)	147 (74)	118 (68)
Sheep		111 (88)	126 (16)	84 (19)
Poultry		223 (352)	246 (70)	187 (69)
Returns per $100 invested				
in all productive livestock	$	$ 146	$170	$134
Poultry		232	246	202
Pounds of pork produced - total		16 772	24 390	14 371
Pounds of pork produced per acre		73.7	106.8	67.4
Feed cost per 100 pounds of pork	$	$7.30 (358)	$ 6.87 (74)	$ 8.29 (68)
Returns per 100 pounds of pork	$	$9.80 (353)	$10.09 (74)	$ 9.74 (68)
Pounds of milk per milk cow*		6166 (200)	6369 (42)	5517 (44)
Dairy returns per milk cow	$	$ 131 (365)	$ 144 (73)	$108 (74)
Average number of hens kept		107.7 (312)	109.2 (66)	112.2 (59)
Number of eggs per hen		94.0 (312)	100.5 (66)	84.8 (59)

*When a number is given in parenthesis () following any item it represents the number of farms for which that item is an average. Where no such number appears, the item is for all farms in the group.

Table 2 - (Concluded)

Item	Your farm	Average of 380 farms	76 most profitable farms	76 least profitable farms
Labor, Power and Machinery Studies				
Percent of farms				
With tractors		77.9	76.3	76.3
With trucks		37.4	40.8	28.9
With tractors and trucks		32.4	32.9	25.0
Without tractors or trucks		16.8	14.5	19.7
Average acres in crops		181.1	178.7	169.4
Average number of men		1.84	1.84	1.81
Crop acres per man		98.2	97.3	93.7
Labor cost per crop acre	$	$ 8.14	$ 8.23	$ 8.72
*Labor efficiency index	_____	100.0	103.0	96.4
Aver. number of workable horses		6.47	6.31	6.25
Crop acres per horse		28.0	28.3	27.1
Value of feed fed to horses	$	$ 453.	$ 429.	$ 468.
Feed cost per workable horse		70.	68.	75.
Horse feed and depreciation per crop acre		2.53	2.35	2.88
Machinery cost per crop acre		2.82	2.64	3.11
Horse and machinery cost per crop acre		5.35	4.99	5.99
*Horse and machinery efficiency index	_____	100.0	111.8	92.0
Labor plus horse and machinery cost per crop acre	$	$ 13.49	$ 13.22	$ 14.71
Expense per $100 gross income	$ _____	$ 50.	$ 39.	$ 70.
Expenses per acre of farm		13.49	13.09	14.55
Farm improvements		1.14	.96	1.36
Horses - decreases		.02	---	.10
Misc. livestock - decreases		---	---	---
Machinery and equipment		2.24	2.07	2.47
Feed, grain and supplies		---	---	---
Miscellaneous livestock expense		.22	.25	.22
Miscellaneous crop expense		1.21	1.29	1.16
Hired and home labor		6.48	6.44	6.93
Taxes, insurance, etc.		1.96	1.88	2.05
Miscellaneous		.22	.20	.26
Family living furnished by farm				
Farm produce used in home		$ 396 (374)	$ 402 (75)	$ 356 (74)
House rent (10% of value)		396 (364)	362 (73)	409 (72)
Total living furnished by farm		792	764	765
Number in family		4.6 (361)	4.7 (73)	4.2 (68)
Farm produce used per person		$86	$ 86	$ 85

*The "labor efficiency index" for any farm is calculated by finding the number of acres of crops worked on that farm with the same labor cost with which 100 acres of crops is worked on the average of farms of the same size and having the same amount of livestock feeding to do. The "horse and machinery efficiency index" is calculated in the same way. The average labor cost per 100 acres of crops for farms the size of yours and with the same amount of feed fed to productive livestock per acre of the farm was _____. The horse and machinery cost per 100 acres of crops was _____.

FARM EFFICIENCY CHART

(See page 11 for an explanation of the use of this chart)

Rate earned on investment	Gross income per acre	Bushels per acre			Percent land in higher profit crops	Feed per acre to productive livestock	Returns per $100 feed to productive livestock				Labor efficiency	Horse and machinery efficiency	Expense per $100 gross income	Size of farm
		Corn	Oats				Cattle	Hogs	Sheep	Poultry*	All productive livestock			
14.0	50	75	70		100	40		260	260	500	240	160	200	30	600
The best one-fifth of the farms in each factor come between this line and the next line below.															
7.2	33	54	54		77	15		161	170	310	173	115	124	42	285
The second best one-fifth of the farms in each factor come between this line and the next line below.															
5.8	29	49	48		71	11		139	131	240	159	104	105	48	240
5.6	27	46	46		68	11		134	111	232	144	100	100	50	228
4.9	26	45	43		66	8		127	100	200	143	94	92	55	195
The second lowest one-fifth of the farms in each factor come between this line and the next line below.															
3.8	22	40	38		60	6		109	63	150	125	81	79	62	160
The lowest one-fifth of the farms in each factor come between this line and the bottom line.															
0.0	10	20	20		35	0		60	-50	40	70	50	50	100	60

*Returns for $100 invested used for poultry.

Explanation of the Farm Efficiency Chart
(See Chart on page 10)

While the farm efficiency chart used in this year's report may appear complicated to those not familiar with it, it will enable cooperators to see clearly the relative efficiency with which different parts of the farm business are handled. If the following things regarding the plan of the chart are understood its use will not be difficult.

The figure in any column just above the double line across the middle of the chart is the average for all the farms to which that factor applies.

The figure in any column just above the top single line across the chart represents approximately the most efficient farm in the factor named at the top of that column. The figure at the bottom of each column of the chart represents approximately the least efficient farm in that factor.

The figure in any column just above the second from the bottom line across the chart represents approximately the most efficient of the one-fifth of the farms which are lowest in that factor. It also represents approximately the least efficient in the next to the lowest one-fifth of the farms in that factor.

Likewise, the figure in any column just above the next to the top line across the chart represents approximately the least efficient of the one-fifth best farms in that factor. It also represents approximately the most efficient of the second to the best one-fifth group of the farms in that factor. The other lines separate the middle group in each factor from the groups next to it.

By drawing a line across each column at approximately the place which represents the efficiency of his farm in each factor and then, by filling in with a colored crayon or pencil the space below such lines, a cooperator can see clearly where his farm stands in efficiency in each factor.

Relation of Labor and Horse Power and Machinery Costs to the Size of Farm and the Amount of Livestock Fed

The use in this report of the "Labor Efficiency Index" and the "Horse Power and Machinery Efficiency Index" is better understood when one realizes the relation of labor costs and horse power and machinery costs to the size of farm and amount of livestock fed. A study of the 380 records shows that for each 40 acres increase in size of farm there was a reduction in labor cost per crop acre of about 41 cents. (Table 3) It was found, for illustration, that the labor cost for the average half section farm was $1.65 a crop acre less than for a quarter section farm feeding the same amount of feed to productive livestock per acre of the farm.

In a similar way for each 40 acres increase in size of farm the cost for horse feed and depreciation and all machinery was found to decrease about 15 cents per crop acre. (Table 4) As an average, the half section farm was found to have 58 cents less cost per crop acre for horse power and machinery than a quarter section farm feeding the same amount of feed per acre to productive livestock.

Table 3. Average Labor Cost per Crop Acre

Variations in total labor cost per crop acre according to the size of the farm and the total value per acre of the whole farm of feed, including pasture, fed to all livestock other than horses. Based on records from the 380 farms used in this report.

Feed used per acre	Total acres in farm							
	100 to 139	140 to 179	180 to 219	220 to 259	260 to 299	300 to 339	340 to 379	380 to 419
$ .00 to 1.99	7.61	7.20	6.78	6.37	5.96	5.55	5.14	4.72
2.00 to 3.99	7.95	7.54	7.12	6.71	6.30	5.89	5.48	5.06
4.00 to 5.99	8.29	7.88	7.46	7.05	6.64	6.23	5.82	5.40
6.00 to 7.99	8.63	8.22	7.80	7.39	6.98	6.57	6.16	5.74
8.00 to 9.99	8.97	8.56	8.14	7.73	7.32	6.91	6.50	6.08
10.00 to 11.99	9.31	8.90	8.48	8.07	7.66	7.25	6.84	6.42
12.00 to 13.99	9.65	9.24	8.82	8.41	8.00	7.59	7.18	6.76
14.00 to 15.99	9.99	9.58	9.16	8.75	8.34	7.93	7.52	7.10
16.00 to 17.99	10.33	9.92	9.50	9.09	8.68	8.27	7.86	7.44
18.00 to 19.99	10.67	10.26	9.84	9.43	9.02	8.61	8.20	7.78
20.00 to 21.99	11.01	10.60	10.18	9.77	9.36	8.95	8.54	8.12
22.00 to 23.99	11.35	10.94	10.52	10.11	9.70	9.29	8.88	8.46

Table 4. Average Horse and Machinery Cost per Crop Acre

Variations in horse feed and depreciation and machinery costs per crop acre according to the size of the farm and the total value per acre of the whole farm of feed, including pasture, fed to all livestock other than horses. Based on records from the 380 farms used in this report.

Feed used per acre	Total acres in farm							
	100 to 139	140 to 179	180 to 219	220 to 259	260 to 299	300 to 339	340 to 379	380 to 419
$ .00 to 1.99	4.62	4.47	4.33	4.18	4.04	3.89	3.75	3.61
2.00 to 3.99	4.85	4.70	4.56	4.42	4.27	4.13	3.98	3.84
4.00 to 5.99	5.09	4.94	4.80	4.65	4.51	4.37	4.22	4.08
6.00 to 7.99	5.32	5.17	5.03	4.89	4.74	4.60	4.45	4.31
8.00 to 9.99	5.55	5.40	5.26	5.12	4.97	4.83	4.68	4.54
10.00 to 11.99	5.79	5.64	5.50	5.36	5.21	5.07	4.92	4.78
12.00 to 13.99	6.02	5.87	5.73	5.59	5.44	5.30	5.15	5.01
14.00 to 15.99	6.26	6.11	5.97	5.83	5.68	5.54	5.39	5.25
16.00 to 17.99	6.49	6.34	6.20	6.06	5.91	5.77	5.62	5.48
18.00 to 19.99	6.72	6.57	6.43	6.29	6.14	6.00	5.85	5.71
20.00 to 21.99	6.96	6.81	6.67	6.53	6.38	6.24	6.09	5.95
22.00 to 23.99	7.19	7.04	6.90	6.76	6.61	6.47	6.32	6.18

For each $10 increase in the value of feed, including pasture, fed to productive livestock for each acre of the farm the labor cost increased an average of $1.70 per crop acre. In this area the livestock consists, mainly, of hogs, beef cattle and dairy cattle, with some sheep and poultry. Those farms feeding less than $2 worth of feed per acre are selling most of the grain raised, while those feeding from $22 to $24 of feed per acre sell only about enough grain to pay for the supplemental feeds purchased. It is seen then that as an average the farm having enough livestock of different kinds to utilize all the produce of the farm has a labor cost of about $3.75 per crop acre more than the farm of the same size that is on a straight grain selling basis. The livestock farm also has an average horse power and machinery cost of about $2.60 per crop acre more than the grain selling farm of the same size.

It is necessary, therefore, to take both the size of the farm and the amount of livestock kept into account in any satisfactory measure of labor and power and machinery efficiency. The "labor efficiency index" and the "horse power and machinery efficiency index" were developed to take into account both the size of farm and amount of livestock. (See footnote Table 2, page 10)

COMPARISON OF FIVE YEARS' RECORDS

A comparison of income, investment and efficiency factors for all farms included in each of the five annual reports of the Farm Bureau-Farm Management Service is shown in Table 5. Most of those who dropped out of the project in 1926 and 1927 were men who stopped farming. Some of those dropping out in 1928 were among those whose farms proved to be unprofitable. While others who were out for one year came back into the project when it was reorganized. About one-half of the farms included in 1929 were of new cooperators who had not kept records before 1929. This situation should be taken into account in studying these comparative records.

It may well be noted that the total expense remained fairly constant at about $13.50 per acre. However, the gross receipts varied from $20.74 per acre in 1926 to $27.86 per acre in 1928. These differences were due largely to differences in price levels, yields and quality of crops produced. There seems to have been some increase in the incomes from dairy and poultry products. An increase in the pounds of pork produced per acre indicates an increase in the size of the hog enterprise.

It is apparent that there has been a decided shift from less of the low profit crops to more of the medium profit crops. Much of this shift has been from oats to barley, spring wheat and soybeans. There seems to be some decrease in the labor cost per acre and also in the horse power and machinery cost. The other expenses, consisting mostly of repairs and depreciation on buildings and fences, taxes and miscellaneous crop and livestock expenses, have remained about constant.

Table 5 - Comparison of Five Years' Records

Items	1925	1926	1927	1928	1929
Number of farm records used	225	210	200	150	380
Rate earned on investment	3.21	2.30	3.72	5.66	5.56
Labor and management wage	$-382.00	$-616.00	$ -46.00	$1084.07	$1003.00
Size of farms in acres	232.0	232.1	231.5	234.6	227.6
Value of land per acre	$ 191.55	$ 192.24	$ 192.84	$ 189.47	$ 184.20
Total investment per acre	258.15	255.93	253.81	251.74	246.12
Gross receipts per acre	22.05	20.74	22.78	27.86	27.17
Total expense per acre	13.77	13.57	13.33	13.60	13.49
Net receipts per acre	8.28	7.17	9.45	14.26	13.68
Receipts and Net Increases - Total	$5115.00	$4813.00	$5274.00	$6534.86	$6185.00
Grain less feeds purchased	1901.00	1961.00	2633.00	3321.89	2936.00
Miscellaneous	105.00	69.00	75.00	85.26	77.00
Livestock - total	3109.00	2783.00	2516.00	3127.71	3172.00
Horses	-	-	5.00	5.30	-
Cattle	557.00	454.00	562.00	670.11	599.00
Dairy products	346.00	353.00	380.00	469.47	611.00
Hogs	1845.00	1689.00	1247.00	1565.90	1579.00
Sheep	101.00	32.00	67.00	109.78	68.00
Poultry	118.00	121.00	110.00	137.02	133.00
Eggs	137.00	130.00	140.00	167.57	179.00
Bees	5.00	4.00	5.00	2.56	3.00
Productive Livestock Records					
Investment per acre	$ 9.62	$ 10.43	$ 10.28	$ 10.84	$ 10.45
Returns per acre	13.29	13.38	10.85	14.68	15.28
Feed used per acre	8.81	8.38	8.06	10.34	10.60
Returns per $100 feed used	150.77	159.70	134.57	141.97	144.00
Pounds of pork produced per acre	66.8	64.0	74.0	76.0	73.7
Bushels per Acre of Crops					
Corn	55.3	51.3	42.0	53.0	46.2
Oats	39.2	37.1	34.5	43.8	45.8
Winter wheat	18.3	20.6	16.8	18.4	21.1
Percent of Tillable Land in					
Higher profit crops	58.2	60.1	59.9	60.8	61.4
Medium profit crops	9.8	7.4	13.2	15.1	13.9
Lower profit crops	32.0	32.5	26.9	24.1	24.7
Expenses per Acre of Farm					
Hired and home labor	$ 6.85	$ 6.67	$ 6.58	$ 6.60	$ 6.48
Horse power and machinery	4.80	4.42	4.38	4.42	4.25
Other expenses	4.71	4.79	4.73	4.79	4.75
Farm produce used in farm home	$ 430.21	$ 466.70	$ 439.15	$ 395.95	$ 396.00

Value of farm Products Used in the Farm Home

The sale values of farm products used in the homes of the cooperators have been estimated and recorded from month to month. The average total value of such products amounted to $396 per farm for the 374 farms on which such records were kept, as shown in Table 6.

Table 6. Amounts and Value of Farm Products Used in the Farm Home Average 374 Farms, 1929

Product	Amounts	Price	Wholesale farm value
Fuel	----	$----	$2
Milk	1080 qts.	.05	54
Cream	150 qts.	.20	30
Butter	82 lbs.	.45	37
Eggs	163 doz.	.30	49
Poultry	----	----	30
Beef	----	----	5
Pork	780 lbs.	.089	70
Honey	6 lbs.	.15	1
Potatoes	13 bu.	1.60	21
Other vegetables	----	----	61
Fresh fruits	----	----	5
Canned fruits and vegetables	150 qts.	.20	30
Miscellaneous	----	----	1
Total			$396

The prices used were approximate wholesale farm prices as follows: milk, 5 cents per quart, or about $2.35 per 100 pounds; cream, 20 cents per pint; butter, 45 cents per pound; eggs, 30 cents per dozen; poultry and other meats, live weight farm price at the time slaughtered; honey, 15 cents per pound; and potatoes, $1.50 to $1.75 per bushel. The value of other vegetables was estimated according to the size and quality of the garden at from $10 to $15 for each person in the family during the garden season. This estimate was based on studies made in former years by the Department of Farm Organization and Management in connection with detailed cost account investigations. Twenty cents per quart was used in case of all vegetables and fruits produced on the farm and canned or preserved for winter use.

The value of these farm products used in the home was not included in the farm receipts as shown in Table 1. However, the values of the poultry and livestock products were included in the returns from each class of livestock in figuring the livestock efficiency factors as shown in Table 2.

The following discussions prepared by R. R. Hudelson and H. C. M. Case of the Department of Farm Organization and Management make up a part of the report sent to all farmers in Illinois who have cooperated in keeping farm accounts with the University of Illinois and their local county farm bureaus. Farm bureaus in 93 counties are cooperating in the work and reports from farm advisers indicate that approximately 3200 farmers are enrolled in the projects this year. The records kept by farmers not included in the Farm Bureau-Farm Management Service are not closely supervised during the year and contain less detailed information and, therefore, provide for a much less complete analysis of the farm business.

Suggestions for Increasing the Usefulness of Farm Accounts

Farming has developed into a highly competitive business during the last generation and prices are now largely determined in large central markets. Along with these changes have come greatly increased requirements for money and credit. This in turn has brought greater chances of money and credit losses. Farming has become a commercial type of business instead of the self contained home producing and home consuming manner of living which prevailed within the last 50 years. This changing situation is forcing the farm operator to a greater dependence upon markets, credit supplies and business methods. The American farmer has more than kept pace with other industries in efficiency of production. To keep pace in other ways he needs to increase his control of markets and credit supplies through organization and to follow the example of many Illinois farmers in adopting better business methods such as the keeping of accounts. Suitable accounts serve to guide the operator of a farm or other business away from unprofitable enterprises and practices in the rapid changes which take place in modern business conditions. Having adopted the practice of keeping accounts and hence having more facts as to the progress he is making the question confronts every farm account keeper as to whether he is using this information to its full advantage. To have the facts is one thing; to face those facts thoughtfully and frankly and act on them is another.

In the farm business reports for the past three years emphasis has been placed on planning the farm for economical operation. Special attention has been given to the principles underlying successful farm organization. These principles are fully discussed in Illinois Bulletin 329, "Organizing the Corn-Belt Farm for Profitable Production." In order that you may consider how completely you have brought your farm into line with these principles, they are listed here as follows:

1. Good yields tend to reduce the unit cost of producing farm crops.
2. A large percentage of land in the higher profit crops means larger farm income.
3. Livestock production as a means of marketing crops makes for larger farm income.
4. Efficient feeding and handling of livestock materially reduces the cost of production.
5. A large volume of business is necessary for profitable farming.
6. A well organized system of crop and livestock production helps use available man labor advantageously.
7. Costs are reduced when the supply of horse and mechanical power fits farm needs and is economically handled.
8. Buildings, machinery, and other equipment expense must be kept under control if low production costs are to be obtained.
9. A good farm layout and a well developed farmstead make for economical operation.
10. Diversity of crop production helps to insure long-time profits.
11. Production planned in accordance with market demands makes for a larger margin of profit.

Many individuals have their farms well organized but must work continuously to comply with the last named principle, namely, "Production planned according to market demands makes for a larger margin of profit." This has to do both with the relative amounts and kinds of farm products produced and with marketing them to best advantage.

The farmer who is making changes in his farm operations to conform with the market for his products should keep in mind first of all the necessity of choos-

ing enterprises and the proportions of each which in combination will make it possible for him to produce at a low cost for a unit of product.

Most Illinois farmers who have been relatively successful as compared with others in their communities have had systematic crop rotations. Successful rotations distribute the need for labor, power and equipment through as much of the year as possible, provide for soil maintenance, control to some extent the development of disease and insect pests and keep as much land as possible in those crops which over a period of years give the widest margin of profit. When new rotations are planned or old ones revised they should be made to meet all of these conditions as completely as circumstances permit. At the same time they should give as uniform a supply of feeds needed in livestock production as possible and keep in line with market trends.

Looking back over the past it is evident that marked changes have been made in kinds of crops grown throughout the corn belt. No doubt further changes both in the kinds of crops and in the proportions of different crops will be made over a period of years. There appears to be some disadvantage, however, in radical and frequent changes in the acreages of crops as compared with following a good rotation. Crop prices are influenced mainly by total production either in the United States or the world as a whole depending on the crop. Total production for most crops depends more on yield per acre than on total acreage. Yield usually cannot be predicted far enough ahead to serve as a guide to the number of acres planted. In the case of some crops which may be carried over in large quantities in comparison with the amount consumed the carryover is important and should be considered in production plans. Broom corn is such a crop. The prices of the common grain crops are affected to a less degree by carryover, although on some years this is an important factor in the market. The common staple crops of Illinois are principally feed crops although they may be sold and moved to some other farm before they are fed. The best opportunities for the average Illinois farmer to take advantage of market changes from year to year are in changing livestock operations so as to market more or less of his crops in the form of livestock or livestock products according to the relation between livestock and crop prices.

Farm account cooperators generally have given more thought to good farm organization than the average farmer. They usually are more interested in price and market information, also. Likewise, a well organized farm based upon the principles of good farm management is in a better position to use this type of information than a poorly organized one.

The foregoing statement is illustrated in the management of many of the more successful farms. One farm with a long record of good earnings as compared with other farms in the same section of the state may be used as an example even though some practices on this farm might not be recommended. This farm has a five-year crop rotation including one year of clover. The clover field is divided each year by a temporary fence located so as to provide enough pasture for the livestock on hand. The remainder of the field is cut for hay after which the temporary fence is taken out and the whole field pastured. On seasons especially favorable to clover growth less acreage is needed for early pasture and the extra acreage is cut for hay, thus providing a surplus to carry over and take care of those seasons when clover growth is small and nearly all of the field is needed for pasture. The livestock on this farm consists of cattle and hogs in addition to the necessary work stock. The cows are a milking strain of Shorthorns. More or less of the milk is marketed according to the relative prices of milk and beef. If markets favor beef the calves are allowed to suckle the cows for a longer period. If markets favor dairy products the calves are raised by hand. More or less grain is fed to the cows

according to whether they are being milked or have been dried up. Calves are marketed at younger or older ages according to market conditions. The hog enterprise also permits considerable adjustment to seasonal and market conditions. It is the regular practice to farrow two litters of pigs each year and raise them by efficient low cost methods but the weights at which they are marketed have been varied according to the relative market outlook for corn and hogs. The breeding herd consists of purebreds and has been kept registered so that breeding stock can be sold when this special market is better than the market for slaughter hogs. The same practice has been followed with respect to cattle. Even the power on this farm has been adjusted to meet seasonal conditions. The crop rotation and livestock system is such as to spread the need for labor and power over most of the year and the power is largely supplied by horses but a tractor is brought into use when weather conditions have held up the work and caused a need for more power over a short season.

This farm is a striking example of the advantages of having a systematic and flexible plan notwithstanding the fact that the cropping system and even the numbers of breeding stock have varied but little over a period of years. It shows the possibilities of making changes to fit changing market and seasonal conditions without disrupting a well tried and balanced plan of operation which gives a low cost of production for each unit of product. At the same time it avoids an error made on some farms of completely going out of one enterprise into another and possibly reversing this action two or three years later.

Suggestions to Farm Account Keepers in Using Outlook Information

Attention is called especially to the "Agricultural Outlook for Illinois" published annually by the College of Agriculture, University of Illinois, as well as to other sources of Outlook information noted at the end of this report. (In the following discussion, where quotations are used, they are taken from the Agricultural Outlook for Illinois for 1930.) As this report or other Outlook information is studied it is suggested that special attention be given to the following points:

1. "Illinois agriculture is built up largely around the production of feed crops for sale or for conversion into livestock and livestock products. Acreages of such crops are stable from year to year and the larger part of the variation in production is the result of differences in yield because of weather conditions."

Feed crops usually are cheaper on the farm where they are produced than on the farm to which they are sold by the amount paid to cover commissions and transportation. Unless the buyer has special market advantages or more efficient livestock than the original seller of the crops his chances of feeding at a profit are less than those of the seller.

2. The demand for feed crops depends upon the numbers of livestock to be fed. Since the World War there has been a downward trend in the total number of animals on farms in the United States. "The general balance between acreages of feed crops and numbers of livestock which has been unfavorable to feed crops for a number of years is about to swing in the opposite direction." In considering such a statement the information regarding each particular class of livestock should be considered carefully.

3. Competition with farmers in other parts of the United States needs to be watched closely. The tendency to increase production of corn in the Great Plains area is bringing the feed grain supply closer to the range country of the west. This

increases the competition for Illinois feeders. The advantage of the western area is due to the fact that crops may be produced there at a very low cost per acre. The area is handicapped, however, by limited rainfall and low yields. This emphasizes the fact that in order to compete advantageously with this type of production, Illinois farmers must secure larger yields per acre than their western competitors. Although the Outlook for oats and barley is not promising, partly because of low cost methods of production in other areas, but largely due to the declining demand for horse feed it seems impractical to displace them entirely in Illinois cropping systems. No other crops follow corn readily and at the same time serve as nurse crops for clovers and alfalfa. The Outlook report carries the following statement about oats, "Farmers who find oats desirable for rotation purposes and still continue to market them should study carefully the possibility of using them for feed on their own farms."

4. The wheat producer of the Great Plains area has made rapid strides toward a lower cost of production per acre by the substitution of efficient machinery for man labor. "The world acreage of wheat is on an upward trend with much potential new wheat acreage in the United States, Canada, Russia and the Southern Hemisphere."

5. In choosing livestock enterprises it is not a good thing to buy into beef cattle breeding at a time when we are at a low point of production and a high point in prices. This does not mean that there should be no expansion in the beef enterprise on farms where there is surplus pasture and hay in the cropping system. Under such conditions some cows can be kept at low cost on feeds otherwise wasted and especially may some expansion be justified where a start of breeding stock is already on hand.

6. If considering the possibilities of dairying or changing the size of that enterprise, farmers may well regard changes in the local market demand as well as conditions over wider areas. "Present unfavorable dairy prices are the result of large surpluses of manufactured dairy products, particularly butter. Excessive holdings of these products are the outgrowth of a small increase in production and a somewhat large decrease in demand. Farmers may do much to bring about a more favorable adjustment between the supply and demand for dairy products. A large part of our total milk production comes from boarder cows. The present period of fairly high cattle prices affords a better market for the sale of non-profitable cows that may be culled from dairy herds than can be expected over the next few years."

Farmers situated so that it seems advisable to bring a dairy enterprise into the system of farming probably can buy the necessary breeding stock at lower prices during the next few years than in the immediate past.

7. Hog production is so universal on Illinois farms that in addition to Outlook information the farmer should at all times give careful consideration to factors that help secure a low cost of production. The expansion of corn production in the western and northwestern edges of the corn belt is bringing Illinois hog producers more competition from that area. This will not displace hog production in Illinois but makes it increasingly important for the Illinois farmer to produce his hogs efficiently. As brought out in much of the Outlook information, hog production offers one of the best opportunities for the Illinois farmer to adjust his operations to market conditions. (See further discussion in the Agricultural Outlook for Illinois, 1930)

8. The corn-belt farm poultry enterprise usually is a small one but farm records show it to be an important factor in the business. The poultry income has been sufficient to help stabilize farming during the post-war depression. As with other farm enterprises, efficient production is essential if the enterprise is to be

conducted at a profit. Outlook information shows that there has been considerable expansion in the poultry enterprise in recent years. Hence it is advisable to watch future trends of the poultry enterprise as well as other farm enterprises.

Sources of Outlook Information

1. Illinois Agricultural Outlook Report

This is a presentation of pertinent facts bearing upon the agricultural situation and an attempt to point out trends with reference to the supply and demand of products produced on Illinois farms. This report is published annually in February and may be had by addressing the Illinois College of Agriculture.

2. The United States Department of Agriculture Outlook Report

This is an attempt to bring together facts relating to prospective world-wide and nation-wide supply and demand conditions which are not readily available to farmers. It is published annually about February 1 and can be had in limited numbers by addressing the Illinois College of Agriculture or U. S. Department of Agriculture.

3. The Agricultural Situation

This is the name of a monthly publication of the Bureau of Agricultural Economics of the U. S. Department of Agriculture. It gives current information on supply, demand and price conditions for the United States and for sections of the United States. It is condensed and provides a good means of keeping Outlook information up to date. This is not a free publication but a subscription can be had for twenty-five cents a year from the Superintendent of Documents, U. S. Department of Agriculture, Washington, D. C.

4. Miscellaneous Market Reports of the U. S. Department of Agriculture

These include a great variety of reports giving supply, demand and price information on different commodities. They are in many cases released over the radio or through market and agricultural papers. Those interested can secure a list of these reports by addressing the Bureau of Agricultural Economics of the U. S. Department of Agriculture, Washington, D. C. The reports listed therein are available without charge to anyone who requests them and shows a need for them. A few of these reports with the approximate dates of release are given below.

1. Monthly Crop Report--These reports, which show acreage, condition, prices, numbers, probable production, or value of principal crops and livestock, are published monthly in "Crops and Markets." A summary in multigraph form is issued from the State "Agricultural Statistician's" office, Springfield, Illinois.

2. Special pig surveys and report on livestock--Pig surveys are published about January 1 and July 1 of each year. They show the available supply of pigs for market and intentions to breed sows for the following season. Reports are also issued showing numbers of livestock on farms January 1.

3. Report of cattle on feed or on movement of feeder cattle--This report is issued about the twelfth of January, April, June, October, and November.

4. Report of sheep and lambs on feed or on movement of lambs--This report is issued about the twelfth of January, March, April, May, July, August, October, and November.

5. Monthly fluid milk market report--The prevailing wholesale and retail prices of milk paid by the different classes of trade, and prices paid to producers in the larger and more important cities of the United States are found in this report.

Sixth Annual Report for the cooperators in the Farm Bureau-Farm Management Service in Livingston, McLean, Tazewell and Woodford Counties for the year 1930

J. B. Andrews, W. A. Herrington, M. L. Mosher, H. C. M. Case

Farmers throughout Illinois had the lowest average net earnings for 1930 that they have experienced in nine years. Previous to 1922 there are not enough farm account records available to give an adequate measure of the average level of farm earnings for the entire state. In 1921, one hundred account keeping farms in Woodford county, which is typical of central Illinois, had an average net loss of practically one percent of the total farm investment. In 1920 thirty-one farms in the same county had an average loss of one-tenth of one percent. For 1930 the accounts for Woodford county show a small net return of about 1.7 percent on the investment. It appears, therefore, that for central Illinois, 1930 farm earnings were slightly higher than for 1920 and 1921. The same statement seems to be true for northern Illinois. The account keepers in the southern part of the state, however, show average net losses for 1930. They suffered more from drought than did the farmers of central and northern Illinois.

The above discussion is based on the records of those farms whose operators keep accounts and submit them to the University of Illinois for analysis. Repeated studies of earnings on all farms in selected areas have shown that average earnings for all farms are lower than for farms included in this accounting service. The difference has been found to be consistently about 2 percent of the investment in favor of the account keepers. In 1925, a study of 113 farms in Gridley township, McLean county, showed that they earned an average of 1.5 percent on the total farm investment. The 225 farms in the Farm Bureau-Farm Management Service in Livingston, McLean, Tazewell, and Woodford counties earned an average of 3.2 percent that same year, or 1.7 percent more on the investment. Gridley township is in about the center of the four county area and conditions there in 1925 were comparable with average conditions for the area. If we deduct 2 percent from the indicated rate earned on accounting farms in Illinois for 1930 it seems evident that the average Illinois farmer earned no return on the farm investment last year. In considering the following figures for the cooperators in the Farm Bureau-Farm Management Service in Livingston, McLean, Tazewell, and Woodford counties, allowance should be made for the fact that the earnings shown are higher than for the average farm.

The 380 farmers in these central Illinois counties who cooperated in the Farm Bureau-Farm Management Service in 1930 earned for the use of capital invested and for the management and risk of operating the business an average of .97 percent on their investments. A wage of $60 a month was allowed as pay for the operator's labor, no salary being deducted for management. If we allow one percent of the investment as pay for management, in this case amounting to $572 a farm, there remains nothing as pay for the risk and use of capital invested in these record keeping farms. A second method of computing earnings is to deduct 5 percent of the investment as pay for the risk and use of capital instead of deducting a labor wage for the operator and assume that the remaining income is pay for labor and management. Following this plan it is found that the average farm operator of this group lacked $1616 of having enough income to pay 5 percent on his investment with nothing left for his labor and management. The average value of the land included in this report was appraised at $184.64 an acre. Other items including improvements, equipment, livestock and feed made a total investment of $248.21 an acre. The land and improvements exclusive of the house averaged $209 an acre.

It is of some interest to note that other industries than farming also suffered a slump in earnings for 1930. For each of the last three years the Illinois Annual Farm Business Reports have shown the average rate earned on invested capital by a large number of companies in various industries other than agriculture. These figures were assembled and reported by a nationally known bank. For 1928 the average rate reported for 1520 companies was 11.7 percent. For 1929, 1520 companies were reported as earning 12.8 percent and for 1930, 1900 companies show 5.7 percent. Unlike farms, these companies pay for management through their salaries to officers and executives. Like the farms included in the Illinois farm accounting project, it is probable that the companies reported are more successful than the average of all companies in the same industries. The 1930 slump in earnings of other industries is here indicated as about as great as in farming but since these other industries slumped from a much higher level they show the usual higher return as compared with farming. After the slump they show a higher rate than was shown for farming in 1928 and 1929, two years of relatively good earnings in both farming and industry as compared with the ten year average.

In a year of declining prices such as that of 1930 one factor causing a lower rate earned is that of lower values of crops and livestock on hand at the close of the year as compared with the beginning of the year. There is some difference in the amount written off of inventories by different account keepers. Since the ending inventory of one year is the same as the beginning inventory of the next year, however, too high a closing inventory means too high a beginning inventory for the following year with a corresponding reduction in earnings for the second year. This is especially true when the products inventoried are sold during the second year. At the top of the table on page 8 there are data giving the 1930 net sales and the reduction in inventory for the average farm and for the high and low earnings groups. These indicate that for the aferage farm in this area in 1930 the reduction in inventory amounted to $1421 while the surplus of sales over expenses was $2884. For the more successful farms, there was a decrease of $1103 in inventory, and $4150 surplus of income over expense. For the less successful farms there was a decrease of $1423 in inventory and a surplus of $1518 in income over expense. The surplus of income over expense comes nearer representing the amount of money the farmer has to spend during the current year than does the net income. For 1930 the reduction in crop inventories was a combination of lower prices and of smaller supplies due to the drought. The reduction in supplies applies chiefly to corn and hay since the small grains generally yielded well in 1930. A larger proportion of the corn and hay crops is stored, the small grains, especially wheat, being marketed before inventory date on many farms.

The value of home grown produce used by the farm family is not included in the income figures as stated in this report. The farm products used at home were found to have an average value of $362 at farm prices. (Table 2, page 11). This item of produce may be considered a labor income for the farm operator and other members of the family in addition to the labor wages deducted in the accounts.

In analyzing these records the investment in the residence of the operator is left out of the farm inventory. Depreciation and upkeep on the residence also are not included. This is for the same reason that the business man in town does not include the cost of his residence as part of his business. The use of the house is considered an income fron an investment outside of the farm business. However in case of the tenant farmer, the use of a residence for which he does not pay a cash rental represents a real saving to him as compared with men engaged in other occupations.

Differences in Earnings Between Farms

The usual wide variations in the earnings on the most profitable and the least profitable farms may well be noted. (Table 1, page 7). The 76 most profitable

of the 380 farms lacked an average of only $66 of having enough income above expense to pay 5 percent on the investment with nothing left to pay the operator for his own labor and management while the 76 least profitable farms lacked $2363 per farm of making 5 percent on the investment with nothing left to pay the operator for his own labor and management.

This amounts to a total difference of $2297 per farm per year in the return for the labor and management of the operators between the high and low groups of farms. This may be expressed in another way by saying, after all expenses were paid and the operator allowed $720 for his own labor and allowance made for other family labor, the most profitable group made 3.71 percent on the investment, while the least profitable group lacked 1.77 percent on the money invested of having income enough to pay expenses.

The one-fifth most profitable farms (76 farms) had a total income of $21.60 an acre, while the one-fifth least profitable farms had an income of only $9.97 an acre. (Table 2, page 8). The total expenses per acre with no charge for interest on the investment on the two groups of farms were $12.57 and $14.22 per acre respectively. It appears that the more profitable group had $11.63 more income per acre with $1.65 less expense per acre. There was a difference of $13.28 between the net income per acre for the 76 most profitable farms and the net loss for the 76 least profitable. On the average sized farm of 230.6 acres, the degree of efficiency found on the most profitable 76 farms would have produced about $3,000 per farm more net income than would have been realized from the degree of efficiency with which the 76 least profitable farms were operated.

These differences in farm earnings should not be taken to mean that all the least profitable farms are necessarily operated at present by poor managers or that the plan of farming is open to severe criticism. Many of the farms have been allowed to deteriorate in fertility of land and equipment over a long period of years. Some of the most profitable farms, on the other hand, have a background of from 10 to 50 years of superior operation from the standpoint of drainage, soil improvement and quality and arrangement of buildings and fences. Some of the least profitable farms are now in the process of being reorganized and built up towards a more profitable basis. The larger percent of tillable land in sweet clover on the one-fifth least profitable than on the most profitable farms indicates that there is a definite tendency for the operators of some of the least profitable farms to be working on the problem of increasing soil fertility. (Table 2, page 9). There are also other indications of improvements being made on many of the farms although the full financial gain cannot be realized for a few years.

Two Opportunities for Increasing Farm Incomes

Farm earnings may be increased through "What the farmer can do for himself" and "What the farmers can do in cooperation." While this report deals with the former, the latter means of helping farmers is important. It is concerned with such matters as the adjustment of tariffs, transportation rates, taxes and the handling of seasonal surpluses of agricultural products. These and similar problems require the organized effort of farmers if they are to present their case effectively before legislative and governmental boards and commissions and in conference with other groups.

Regarding what the farmer can do for himself, that is concerned with the efficiency with which he operates his own farm business. The wide differences in earnings on farms included in this study operated under similar conditions of soil, climate and markets, show that the individuals have large opportunities of improving their incomes. This can be accomplished through adopting plans for the organization and operation of their farms which have proved most profitable. In fact the earnings on most farms can be increased more through increased efficiency in operation than can be expected through any rational adjustments of tariff, freight rates or taxes or im-

proved handling of seasonal surpluses.

Increased efficiency on the best corn-belt land is justified as a safe means of increasing the farm income as it is the most effective way of reducing the costs of production of each unit of product. Likewise, it will be an effective way of discouraging further expansion of farming to cheap marginal land which should be held out of agricultural production under present conditions.

A careful study of his report by each cooperator will, it is believed, enable him to know rather definitely where he can most readily increase the efficiency of his farm business and how other farmers have more successfully conducted that part of the farm work.

Location of Differences in Incomes Between the More Profitable and the Less Profitable Farms

Most of the differences of approximately $3,000 in the average net earnings between the 76 most profitable and the 76 least profitable farms is accounted for in Chart 1, page 8. .

Size of Farm and Value of Land. Under the conditions existing in 1930, the larger farms apparantly had some advantage over the smaller ones. Table 2, page 8 indicates that the 76 most profitable farms averaged about 9 acres larger than all 380 and that the 76 least profitable were about 43 acres smaller than the average of all farms. It is shown also in Table 3, page 13 that the 76 smallest farms, averaging 131.1 acres in size earned only .15 percent on their investment while the 76 largest farms averaged 378.6 acres and earned 1.34 percent. It is apparent that with a season unusually favorable for doing field work, the operators of larger farms were able to affect material savings for labor, power and machinery as compared with those on smaller farms. (Table 5, page 17).

The more profitable farms apparently had a little advantage over the less profitable in quality of land as shown by an appraised value of $7.70 more per acre. On the other hand, the less profitable farms show a greater appraised value of farm improvements of $4.95 per acre. The farm improvements include buildings, except the residence, the fences and such portions of the cost of limestone and rock phosphate as are carried in the inventory. Limestone and rock phosphate are entered in the inventory at full cost at the end of the year that they are applied. Limestone is then depreciated 20 percent of the cost each year for 5 years and phosphate is depreciated 10 percent per year for 10 years.

Different weather conditions had some influence on the farm earnings in 1930; however, on the whole, it can be safely stated that most of the differences in net incomes were due to the differences in management during 1930 and previous years.

Crop Yields. The average bushels of grain per acre and the average tons of hay per acre are given in Table 2 for all 380 farms, the 76 most profitable and the 76 least profitable farms. The days of pasture per acre are estimates. About the same percentage difference in pasture days between the more and less profitable farms was used as the records showed in recorded yields of the hay crops. By including such estimates for pasture and the small acreage of miscellaneous crops, all the tillable land of the farm is accounted for and the analysis gives a more accurate idea of the total differences due to differences in yields of crops than would be true if only the grain and hay crops for which yields were recorded were used. By multiplying the difference in yield of each crop secured on the two groups of farms by the acres of that crop grown on the average of all farms and by the given price one can determine the approximate difference in gross income due to differences in yield of that crop. The total of such differences for all crops including the tillable pasture land amounts to $1,091. (Chart 1, page 8).

Efficiency of Livestock. The 76 most profitable farms realized $144 from each $100 worth of feed fed to productive livestock while the 76 least profitable farms received only $107 or a difference of $37 for each $100 worth of feed used. The average amount of feed used on all farms was valued at $2244 at farm prices. The larger returns for each $100 of this feed used on the more profitable farms accounts for $830 of the difference in average gross income between the two groups of farms. This does not include the cost of keeping horses on the two groups of farms. This greater income to the more profitable farms for each $100 worth of feed used was apparent in case of each class of livestock. For beef cattle, the difference was $46; mixed beef and dairy herds, $65; dairy herds, $47; hogs, $31; sheep, $29; and poultry, $29.

About two-thirds of the grain produced on these farms in 1930 was fed, the rest being sold as grain. In areas where all the grain is fed on the farms, this matter of livestock efficiency becomes relatively more important.

Power and Machinery Costs. The total cost per acre of horses and tractor power and machinery on the most profitable farms amounted to only $3.54 per acre compared with a cost of $4.77 per acre on the least profitable farms. This difference in cost of power and machinery of $1.23 per acre would amount to a difference of $284 less cost per farm in favor of the most profitable farms.

Cropping System. An analysis of the data in Table 2, page 9 shows that there was about $219 more gross income on the average of the more profitable than the less profitable farms because a larger percent of the tillable land was in crops that bring a larger income per acre. For illustration the data in Table 2 shows that there was 2.6 percent more of the tillable land in corn on the more profitable than on the less profitable farms. Two and six tenths percent of the 207.9 acres of tillable land on the average of all farms would be 5.4 acres. By multiplying the average yield of corn on all farms by this 5.4 acres and by the price used one can determine the difference in value of crops on the two groups of farms due to the difference in proportion of land in corn. By applying this same calculation to all crops including tillable pasture it is found that approximately $219 of the difference in gross income was due to differences in the cropping systems.

Amount of Livestock. The more profitable farms fed $11.65 worth of feed per acre, valued at farm prices, while $9.36 worth of feed per acre was fed on the less profitable farms. In general, only about two-thirds of the grain produced on these farms was fed on the farms. As an average of all farms, for each $100 worth of feed fed there were livestock returns of $126, that is, the product from $100 worth of feed fed on the farm was worth $26 more than the farm price of the feed. This difference applied to the additional $2.29 worth of feed per acre used on the more profitable farms accounts for only $137 of the total difference between the two groups.

Prices of Grain. There was very little difference in average prices received for grain on the two groups of farms. The more profitable group received five cents more per bushel for corn, one cent less for oats and one cent a bushel less for wheat. By applying these differences in price to the bushels sold on the average of all farms it is found that the total difference was only $128 in favor of the more profitable farms.

It may well be noted in Table 2, page 10 that there was a difference of 35 cents per hundred pounds in the average price received for all pork sold on the two groups of farms. This difference applied to the 17,250 pounds sold on an average of all the farms accounts for $60 in favor of the more profitable group of farms. This and a similar difference of $10 due to a better price of 2 cents a dozen for eggs and any variations due to differences in prices of cattle and dairy products are a part of the $830 advantage that the more profitable farms had due to greater livestock efficiency.

This analysis of prices received by the two groups of farmers shows that differences in prices make up relatively a small part of the difference of approximately $3,000 between the two groups of farms.

Efficiency of Man Labor. The total labor cost, including the operator's and family labor at hired man rates, was $5.85 per acre on the 76 more profitable farms and $6.34 on the less profitable ones. These were the net costs per acre after credit was given for the time spent off the farm which amounted to 23 cents and 13 cents per acre for the high and low groups respectively. This difference of 49 cents per acre applied to the average size of all farms amounts to $113. This small difference is more significant when one realizes that the returns were more than twice as high on the more profitable farms.

Miscellaneous Expenses. Expenses other than labor, power and machinery amounted to $4.49 and $4.94 per acre on the respective groups of farms. This difference of 45 cents per acre accounted for only $104 of the differences in net incomes of the groups of farms.

Table 1.--Summary of the Year's Farm Business

Item	Your farm	Average of 380 farms	76 most profitable farms	76 least profitable farms
Capital Investments- Land	$	$42 577	$43 466	$32 683
Farm Improvements		5 616	5 183	5 000
Horses		651	621	580
Cattle		1 349	1 594	1 084
Hogs		792	995	656
Sheep		116	82	99
Bees		8	3	7
Poultry		174	183	164
Livestock - Total		3 090	3 478	2 590
Machinery and equipment		2 115	2 100	1 872
Feed, grain and supplies		3 839	4 028	2 960
Total Investment	$	$57 237	$58 255	$45 105
Receipts-Net Increases				
Horses		---	---	---
Cattle		341	460	165
Hogs		1 335	2 014	867
Sheep		24	27	13
Bees		2	---	---
Poultry		66	93	40
Egg sales		152	195	144
Dairy sales		583	915	362
Livestock - Total		2 503	3 704	1 591
Feed, grain and supplies		969	1 326	223
Labor off farm		72	111	49
Miscellaneous receipts		15	28	10
Total Receipts - Net Increases	$	$ 3 559	$ 5 169	$ 1 873
Expenses - Net Decreases				
Farm improvements	$	259	244	261
Horses		20	3	34
Miscellaneous livestock decreases		---	---	2
Machinery and equipment		537	476	492
Feed, grain and supplies		---	---	---
Livestock expense		48	56	45
Crop expense		230	241	201
Hired labor		479	567	323
Taxes		471	480	372
Miscellaneous expenses		52	54	49
Total expenses - Net Decreases	$	$ 2 096	$ 2 121	$ 1 779
Receipts Less Expenses	$	$ 1 463	$ 3 048	$ 94
Total unpaid labor		905	887	893
Operator's labor		688	686	691
Family labor		217	201	202
Net income from investment and management		558	2 161	-799
Rate earned on investment	%	.97 %	3.71 %	-1.77 %
Return to capital and operator's labor and management		1 246	2 847	-108
5 percent of capital invested		2 862	2 913	2 255
Labor and management wage	$	$-1 616	$ -66	$-2 363

Table 2.--Important Factors by Which the Farm Business May be Studied
Underlined factors are the ones used on chart, Page 12

Item	Your farm	Average of 380 fams	76 most profitable farms	76 least profitable farms
Receipts and net increases less expenses and net decreases	$	$ 1 463	$ 3 048	$ 94
Total sales less total expenses		2 884	4 150	1 518
Inventory increases		---	---	---
Inventory decreases		1 421	1 103	1 423
Gross receipts per acre	$	$ 15.43	$ 21.60	$ 9.97
Total expense per acre		13.01	12.57	14.22
Net receipts per acre		2.42	9.03	-4.25
Size of farm		230.6	239.3	187.9
Total investments per acre	$	$ 248.21	$ 243.45	$ 240.05
Land		184.64	181.64	173.94
Farm improvements		24.35	21.66	26.61
Machinery and equipment		9.17	8.78	9.96
Feed, grain and supplies		16.65	16.83	15.75
Horses		2.82	2.60	3.09
Productive livestock		10.58	11.94	10.70
Percent of farm tillable		90.2	88.0	87.9
Percent of tillable land in all crops		89.0	90.1	88.9
left in legumes for year		16.8	17.9	18.1
with sweet clover plowed in spring		3.7	4.7	3.8

Chart 1.--Location of Differences in Incomes Between the 76 Most Profitable and the 76 Least Profitable Farms

Factors considered	The lengths of the shaded bars are in proportion to the amounts of the differences	Average difference
Crop yields	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	$1 091
Efficiency of livestock	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	830
Cost of power and machinery	xxxxxxxxxxxxx	284
Cropping system	xxxxxxxxxx	219
Amount of livestock	xxxxxxx	137
Price of grain	xxxxxx	128
Cost of man labor	xxxxx	113
Miscellaneous expenses	xxxx	104
Total located differences		$2 906

Table 2.--(Continued) Crop Production Data

Crops grown	Profitableness of crop	Prices used	Acres grown			Yields per acre				Percent of tillable land in crops			
			Your farm	Aver. of 380 farms	Aver. of 76 high farms	Aver. of 76 low farms	Your farm	Aver. of 380 farms	Aver. of 76 high farms	Aver. of 76 low farms	Your farm	Aver. of 380 farms	Aver. of 76 high farms	Aver. of 76 low farms
Grain-- Corn	high	$ .75		98.3	100.0	74.3	____	36.1	39.9	31.3		47.3	47.5	44.9
Oats	low	.36		44.0	38.0	33.8	____	35.8	40.2	32.2		21.2	18.1	20.5
Winter wheat	high	.79		12.1	13.6	12.0	____	24.9	28.9	22.1		5.8	6.5	7.2
Spring wheat	med.	.79		3.1	3.2	1.4	____	22.9	23.8	20.7		1.5	1.5	.8
Barley	med.	.50		5.0	8.7	3.3	____	23.6	24.0	20.7		2.4	4.1	2.0
Soybeans	med.	1.00		3.4	2.2	2.5	____	17.1	19.1	15.0		1.6	1.1	1.5
Miscellaneous		.40		.5	.3	.8	____	----	----	----		.2	.1	.5
Hay-- Timothy	low	13.50		.6	.4	1.2		.9	.9	.9		.3	.2	.7
Clover	med.	13.50		4.4	3.8	4.8		1.1	1.3	.9		2.1	1.8	2.9
Alfalfa	high	17.50		4.2	5.5	4.0		2.1	2.3	1.8		2.0	2.6	2.4
Clo.and tim.	med.	13.50		1.7	2.0	1.5		1.0	1.2	.7		.8	1.0	.9
Soybeans	med.	13.50		2.3	2.6	2.5		1.6	2.0	1.1		1.1	1.2	1.5
Miscellaneous		13.50		.5	.1	.6		---	---	---		.3	.0	.4
Miscellaneous crops		-----		5.0	9.4	4.3		---	---	---		2.2	4.5	2.7
							Pasture days. See note*							
Pasture--Bluegrass	low	.10		4.5	2.2	4.3		65	75	55		2.2	1.0	2.6
Timothy	low	.10		1.6	.5	1.8		65	75	55		.8	.2	1.1
Clover	med.	.10		1.2	1.3	.6		70	85	55		.6	.6	.4
Sw. clover	high	.10		6.0	5.8	7.9		85	100	70		2.9	2.8	4.8
Clo. and tim.	med.	.10		4.8	4.9	2.2		70	85	55		2.3	2.3	1.3
Sw. clo. mixed	high	.10		3.0	4.7	.3		85	100	70		1.5	2.2	.2
Alfalfa	high	.10		.3	.6	.2		85	100	70		.2	.3	.1
Miscellaneous		.10		1.4	.8	1.0		75	90	60		.7	.4	.6
Total tillable land				207.9	210.6	165.3						100.0	100.0	100.0
Percent of tillable land in all higher profit crops												61.9	66.2	61.7
Percent of tillable land in all medium profit crops												13.4	14.2	13.0
Percent of tillable land in all lower profit crops												24.7	19.6	25.3
Percent of tillable land in all higher plus one-half medium profit crops											____	68.5	73.3	68.2

*Note--The numbers of pasture days per acre as used here are estimated standards for the drought year of 1930. The percentage differences between the high and low groups of farms are comparable to the recorded yields of hay crops.

Table 2--(Continued)

Item	Your farm	Average of 380 farms	76 most profitable farms	76 least profitable farms
Productive livestock				
Average investment per acre	$	$ 9.89	$ 11.48	$ 9.66
Total returns per acre		12.22	16.82	10.03
Feed used per acre		9.74	11.65	9.36
Feed to all productive livestock	$	$2244	$2787	$1759
Beef cattle*		1854 (40)	1870 (11)	2531 (3)
Mixed cattle		788 (72)	840 (14)	597 (17)
Dairy cattle		762 (258)	996 (50)	643 (56)
Hogs		1123 (362)	1552 (72)	891 (72)
Sheep		170 (132)	157 (26)	169 (27)
Poultry		165 (366)	187 (74)	156 (71)
Returns per $100 feed fed to all Productive livestock	$	$ 126	$ 144	$ 107
Beef cattle		92 (40)	116 (11)	70 (3)
Mixed cattle		116 (72)	155 (14)	90 (17)
Dairy cattle		131 (258)	151 (50)	104 (56)
Hogs		128 (362)	142 (72)	111 (72)
Sheep		41 (132)	52 (26)	23 (27)
Poultry		184 (366)	201 (74)	172 (71)
Returns per $100 invested in poultry	$	$ 187	$ 213	$ 174
Pounds of pork produced - total		16 952	24 119	11 641
Pounds of pork produced per acre		72.0	100.8	62.0
Feed cost per 100 pounds of pork	$	$ 6.86 (362)	$ 6.31 (72)	$ 7.78 (72)
Returns per 100 pounds of pork	$	$ 8.75 (362)	$ 8.95 (72)	8.66 (72)
Pounds of milk per milk cow		6574 (283)	7427 (61)	6186 (57)
Dairy returns per milk cow	$	$ 123 (368)	$ 142 (74)	$ 106 (75)
Average number of hens kept		114.0(281)	128.2(56)	105.3(57)
Number of eggs per hen		93.5(281)	101.7(56)	93.2(57)
Bushels of corn sold		2329	2491	1492
Bushels of oats sold		895	864	517
Bushels of wheat sold		297	392	196
Pounds of pork sold		17250	24262	12367
Dozens of eggs sold		518	646	521
Average price received for corn	$	$ .75	$ .77	$ .72
Average price received for oats		.36	.36	.35
Average price received for wheat		.79	.79	.78
Average price received for pork		9.14	9.40	9.05
Average price received for eggs		.28	.28	.26
Percent of average price received for all	%	100.0 %	102.7 %	97.4 %

*When a number is given in parenthesis () following any item it represents the number of farms for which that item is an average. Where no such number appears, the item is for all farms in the group.

Table 2--(Continued)

Item	Your farm	Average of 380 farms	76 most profitable farms	76 least profitable farms
Labor, Power and Machinery Studies				
Percent of farms with tractors		81.1	84.2	76.3
Percent of farms with trucks		39.2	38.2	32.9
Average acres in crops		185.1	189.8	147.0
Average number of men		1.79	1.88	1.61
Crop acres per man		103.4	101.0	91.3
Labor cost per crop acre	$	$ 7.29	$ 7.38	$ 8.10
Man work units per man[1]		232.1	247.1	211.8
Aver. number of workable horses		6.12	5.89	5.80
Crop acres per horse		30.2	32.2	25.3
Value of feed fed to horses	$	$ 382	$ 368	$ 370
Feed cost per workable horse		62	62	64
Horse feed and depreciation per crop acre		2.17	1.95	2.75
Machinery cost per crop acre		2.90	2.51	3.35
Horse and machinery cost per crop acre		5.07	4.46	6.10
Horse and machinery efficiency index[2]		100.0	125.8	91.1
Labor plus horse and machinery cost per crop acre	$	$ 12.36	$ 11.84	$ 14.20
Expense per $100 gross income	$	$ 84	$ 58	$ 143
Expenses per acre of farm		13.01	12.57	14.22
Farm improvements		1.12	1.02	1.39
Horses - decreases		.09	.01	.18
Misc. livestock - decreases		----	----	.01
Machinery and equipment		2.33	1.99	2.62
Feed, grain and supplies		----	----	----
Miscellaneous livestock expense		.21	.23	.24
Miscellaneous crop expense		1.00	1.01	1.07
Hired and home labor		6.00	6.08	6.47
Taxes, insurance, etc.		2.04	2.00	1.98
Miscellaneous		.22	.23	.26
Family living furnished by farm				
Farm produce used in home	$	$362 (372)	$377 (74)	$330 (75)
House rent (10% of value)		400 (370)	400 (75)	388 (73)
Total living furnished by farm		762	777	718
Number in family		4.5 (370)	4.6 (75)	4.3 (73)
Farm produce used per person	$	$80	$82	$77

1/ A man work unit is a measure of the average amount of farm work done in one 10 hour day. See page 15 for standards used and further explanation.

2/ The "horse and machinery efficiency index" for any farm is calculated by finding the number of acres of crops worked on that farm with the same horse and machinery cost with which 100 acres of crops are worked on the average of farms of the same size and having the same amounts of livestock feeding to do. The average horse and machinery cost per 100 acres of crops for farms the size of yours and with the same amounts of feed fed to produceive livestock per acre of the farm was $_____.

Farm Efficiency Chart

(See page 13 for an explanation of the use of this chart)

Rate earned on investment	Gross income per acre	Bushels per acre			Percent land in higher profit crops	Feed per acre to productive livestock	Returns per $100 feed to productive livestock					Man work units per man	Horse and machinery efficiency	Percent of average prices received	Expense per $100 gross income	Size of farm
		Corn	Oats				cattle	Hogs	Sheep	Poultry*	All productive livestock					
8.0	50	60	65		100	40		280	260	600	250	400	240	140	40	600
Each of the best one-fifth of the farms in each factor comes between this line and the next line below.																
2.3	21	43	44		77	14		150	69	257	152	272	131	107	70	295
Each of the second best one-fifth of the farms in each factor comes between this line and the next line below.																
1.2	17	38	38		71	10		137	51	200	135	244	116	103	82	240
1.0	15	36	36		68	10		128	41	187	126	232	100	100	84	231
.3	14	34	34		66	8		117	32	161	123	218	99	99	95	195
Each of the second lowest one-fifth of the farms in each factor comes between this line and the next line below.																
-.6	12	29	29		61	5		97	-20	117	104	195	85	97	114	160
Each of the lowest one-fifth of the farms in each factor comes between this line and the bottom line.																
-5.0	5	8	10		40	1		0	-200	0	50	100	50	83	200	30

*Returns for $100 invested used for poultry.

Explanation of the Farm Efficiency Chart
(See Chart on page 12)

While the farm efficiency chart used in this year's report may appear complicated to those not familiar with it, it will enable cooperators to see clearly the relative efficiency with which different parts of the farm business are handled. If the following things regarding the plan of the chart are understood its use will not be difficult.

The figure in any column just above the double line across the middle of the chart is the average for all the farms to which that factor applies.

The figure in any column just above the top single line across the chart represents approximately the most efficient farm in the factor named at the top of that column. The figure at the bottom of each column of the chart represents approximlately the least efficient farm in that factor.

The figure in any column just above the second from the bottom line across the chart represents approximately the most efficient of the one-fifth of the farms which are lowest in that factor. It also represents approximately the least efficient in the next to the lowest one-fifth of the farms in that factor.

Likewise, the figure in any column just above the next to the top line across the chart represents approximately the least efficient of the one-fifth best farms in that factor. It also represents approximately the most efficient of the second to the best one-fifth group of the farms in that factor. The other lines separate the middle group in each factor from the groups next to it.

By drawing a line across each column at approximately the place which represents the efficiency of his farm in each factor and then, by filling in with a colored crayon or pencil the space below such lines, a cooperator can see clearly where his farm stands in efficiency in each factor.

Rate Earned on the Total Farm Investment as Related to Ten Factors Used on the Farm Efficiency Chart.

When a cocperator finds in making up his farm efficiency chart that his farm falls in the high one-fifth, the low one-fifth or any of the intermediate groups in any factor, he is interested in knowing what the average rate earned on the investment was for other farms in the same group. This information is given in Table 3, page 14. It may be noted, for illustration, in the Farm Efficiency Chart, page 12 , that the one-fifth of the farms that had the best corn yields produced averages of from 43 to 60 bushels per acre per farm. Table 3, page 14 shows that the agerage yield of all the corn on those 76 farms was 47.2 bushels per acre and that those farms earned an average rate of 1.77 percent on the total farm investment. On the other hand the chart shows that the 76 farms that had the lowest corn yields, produced only from 8 to 29 bushels per acre. Table 3, page 14 shows that the 76 farms with the low corn yields produced an average of only 24.3 bushels per acre and earned an average rate of -.29 percent on the total farm investment.

The difference of 2.06 percent in the average rate earned between the 76 farms having the largest corn yields and the 76 farms with the lowest yields should not be considered as caused entirely by the difference of 22.9 bushels per acre in the yield of corn. Other factors helped to cause the difference in net income. The fact remains, however, that the 76 farms with the best corn yields did make an average return of 2.06 percent of the investment more than was earned on the 76 farms having the low corn yields.

Table 3.--Average Efficiency and Average Rate Earned on Groups of Farms Ranked According to Ten of the Major Factors Considered in the Farm Efficiency Chart on Page 12

Efficiency factors	Best 76 farms in factor considered	Second best 76 farms in factor considered	Average of all 380 farms	Second lowest 76 farms in factor considered	Lowest 76 farms in factor considered
Gross income per acre	$27.76	$18.67	$15.43	$13.06	$ 9.67
Average rate earned	2.73%	1.47%	.97%	.22%	-1.17%
Bushels of corn per acre	47.2	39.9	36.1	31.6	24.3
Average rate earned	1.77%	1.29%	.97%	.43%	-.29%
Percent of tillable land in higher profit crops	82.5%	74.1%	68.5%	63.4%	55.4%
Average rate earned	1.45%	.75%	.97%	.70%	.29%
Feed per acre to all productive livestock	$19.79	$11.80	$ 9.74	$ 6.28	$ 3.43
Average rate earned	1.18%	.94%	.97%	.33%	.73%
Returns per $100 fed to all productive livestock	$175	$143	$126	$114	$89
Average rate earned	1.85%	1.49%	.97%	.50%	-.51%
Man work units per man	315	257	232	206	168
Average rate earned	1.65%	1.11%	.97%	.86%	-.02%
Horse and machinery efficiency index	156.4	122.5	100.0	92.6	72.8
Average rate earned	1.27%	1.06%	.97%	.59%	-.22%
Percent of average prices received for products	114.4	104.7	100.0	98.4	93.4
Average rate earned	1.59%	.72%	.97%	.68%	.32%
Expense per $100 gross income	$60	$76	$84	$104	$144
Average rate earned	3.57%	1.75%	.97%	-.23%	-1.81%
Acres in farm	378.6	259.4	230.6	169.5	131.1
Average rate earned	1.34%	.91%	.97%	.99%	.15%

Analysis of Horse Power and Machinery Costs

Horse power and machinery costs on corn-belt farms make up a larger part of all farm operating costs than any other single item except labor. Many who have been keeping these Farm Management Service records have had difficulty in seeing wherein their costs for horse power and machinery were particularly high or low. In order to analyze these costs more completely, in this year's report the farms have been grouped according to size of farm and the use of tractor and truck. (Table 5, page 17).

By comparing the records for his farm with the average of other farms of the same size and having the same type of power and equipment as his, each cooperator may locate rather definitely the places that his horse and machinery costs are particularly high or low.

The information in this table is presented only for the purpose indicated above. Data for only one year on so small a number of farms is not considered sufficient from which to draw conclusions regarding the relative profitableness of farming with or without tractors or trucks. Neither is it enough from which to draw conclusions regarding the relative profitableness of different sizes of farms.

Labor Efficiency

The measure of man labor efficiency used in this report is the average number of man work units worked per man during a full year of 12 months. A man work unit is a measure of the average amount of farm work done in one 10 hour day. The amounts of work done in a 10-hour day used in calculating the number of man work units of labor performed on these farms are based on detailed cost records kept during the four years of 1926, 1927, 1928 and 1929 on about 20 farms in Champaign and Piatt counties. In Table 4, page 15 is given the standard number of hours of man labor required throughout the year to care for one acre of each crop or for an animal unit of each kind of livestock. In this study, one animal unit consists of one mature horse or cow, two colts or calves or yearling cattle in the breeding herd, two feeder cattle, five mature sheep, 10 to 15 lambs or feeder sheep and 100 hens. The number of each class of livestock was calculated for each farm by taking the average of the numbers on hand at the beginning of the year and at the end of the year.

Table 4.--Standards for Calculating Man Work Units
(Champaign-Piatt 4 Year Average, 1926-1929)

Crops			Livestock		
Kind of crop	Man hours per acre	Man work units per acre	Kind of livestock	Man hours per animal unit	Man work units per animal unit
Corn	13.3	1.33	Beef cattle	22.0	2.20
Oats	6.5	.65	Mixed cattle	52.0	5.20
Wheat (winter)	10.2	1.02	Dairy cattle	82.1	8.21
Wheat (spring)	7.7	.77	Hogs (per 100		
Rye	10.2	1.02	pounds produc-		
Barley	7.1	.71	ed)	2.7	.27
Soybeans	10.9	1.09	Sheep	31.6	3.16
Alfalfa	13.1	1.31	Poultry	207.5	20.75
Clover	7.6	.76	Horses	48.9	4.89
Timothy	6.4	.64			
Soybean hay	15.9	1.59			
Sweet corn	13.3	1.33			
Canning peas	12.0	1.20			

Value of Farm Products Used in the Farm Home

The amounts of farm products used in the homes of the cooperators have been estimated and recorded from month to month. The average total value of such products at about the farm selling prices amounted to $362 per farm for the 372 farms on which such records were kept, as shown in Table 6, page 18.

The prices used were approximate wholesale farm prices as follows: milk, 20 cents per gallon, or about $2.35 per 100 pounds; cream 20 cents per pint; butter, 35 cents per pound; eggs, 25 cents per dozen; poultry and other meats, live weight farm price at the time slaughtered; and potatoes $1.00 per bushel. The value of other vegetables was estimated according to the size and quality of the garden and the number of persons in the family during the garden season. This estimate was based on studies made in former years by the Department of Farm Organization and Management in connection with detailed cost account investigations. Twenty cents per quart was used in case of all vegetables and fruits produced on the farm and canned or preserved for winter use.

The value of these farm products used in the home was not included in the farm receipts as shown in Table 1, page 7. However, the values of the poultry and livestock products were included in the returns from each class of livestock in figuring the livestock efficiency factors as shown in Table 2, page 10.

Table 5.--Analysis of Horse Power, Mechanical Power, and Machinery Costs

	Your farm	Farms under 180 acres			Farms of 180 to 299 acres			Farms of 300 acres or more		
		With tractor and truck	With tractor without truck	Without tractor	With tractor and truck	With tractor without truck	Without tractor	With tractor and truck	With tractor without truck	Without tractor
Number of farms		22	48	30	55	57	25	29	28	1
Investments										
Truck	$	$246	$ --	$132 1/	$295	$ --	$166 2/	$247	$ --	$---
Auto		200	202	159	244	209	163	172	218	360
Tractor		409	511	---	565	527	---	810	662	---
Other machinery		1267	1059	877	1554	1353	940	2222	1701	821
All machinery		2122	1772	1049	2658	2089	1150	3451	2581	1181
Horses		418	461	569	596	579	803	803	1033	955
Horses and machinery		2540	2233	1618	3254	2668	1953	4254	3614	2136
Expenses and net decreases										
Truck	$	$104	$---	$ 89 1/	$ 84	$---	$ 70 2/	$113	$---	$---
Auto		104	115	93	96	114	89	94	140	133
Tractor		146	171	---	217	246	---	442	364	---
Other machinery		176	150	119	209	191	167	299	272	210
Total machinery cost		530	436	221	606	551	276	948	776	343
Horse feed and depreciation		303	249	393	364	385	499	479	549	726
Machinery and horse cost		833	685	614	970	936	775	1427	1325	1069
Labor cost		1062	993	925	1359	1314	1333	1826	1913	1491
Labor, machinery and horse cost		1895	1678	1539	2329	2250	2108	3253	3238	2560
Expenses per acre of crops										
Machinery	$	$ 4.20	$ 3.65	$ 2.09	$ 3.09	$ 3.06	$ 1.60	$ 2.99	$ 2.63	$ 1.21
Horse feed and depreciation		2.40	2.08	3.73	1.86	2.13	2.89	1.51	1.86	2.57
Machinery and horses		6.60	5.73	5.82	4.95	5.19	4.49	4.50	4.49	3.78
Labor		8.42	8.30	8.78	6.93	7.28	7.73	5.76	6.47	5.27
Labor, machinery, and horses		15.02	14.03	14.60	11.88	12.47	12.22	10.26	10.96	9.05
Total acres in farm		150.4	148.1	137.8	240.7	226.1	222.8	383.5	369.7	320.0
Acres in crops		126.1	119.5	105.4	196.2	180.5	172.6	317.0	295.4	283.0
Feed per acre to productive livestock	$	$12.47	$ 9.60	$11.82	$ 9.50	$ 9.29	$ 7.75	$ 8.70	$ 8.13	$ 3.33

1/Average of 3 farms with trucks; 2/Average of 7 farms with trucks.

Table 6.--Amounts and Value of Farm Products Used in the Farm Home
Average 372 Farms, 1930

Product	Amounts	Price	Wholesale farm value
Fuel	-----	$----	$ 3
Milk	300 gal.	.20	60
Cream	155 pts.	.20	31
Butter	86 lbs.	.35	30
Eggs	192 doz.	.25	48
Poultry	-----	----	29
Beef	-----	----	8
Pork	854 lbs.	.087	74
Potatoes	14 bu.	1.00	14
Other vegetables	-----	----	36
Fresh fruits	-----	----	4
Canned fruits and vegetables	120 qts.	.20	24
Miscellaneous	-----	----	1
Total			$362

Comparison of Six Years' Records

A comparison of income, investment and efficiency factors for all farms included in each of the 6 annual reports of the Farm Bureau-Farm Management Service in Livingston, McLean, Tazewell and Woodford Counties is shown in Table 7, page 19. Most of those who dropped out of the project in 1926 and 1927 were men who stopped farming. Some of those dropping out in 1928 were among those whose farms proved to be unprofitable, while others who were out for one year came back into the project when it was reorganized. About one-half of the farms included in 1929 were of new cooperators who had not kept records before 1929. This situation should be taken into account in studying these comparative records.

It may well be noted that the total expense remained fairly constant at about $13.50 per acre with a little drop in 1930 as compared with former years. However, the gross receipts varied from $27.86 per acre in 1928 down to only $15.43 in 1930. These differences were due largely to differences in price levels, yields and quality of crops produced.

It is apparent that there has been a decided shift from less of the low profit crops to more of the medium and high profit crops. Much of this shift has been from oats to barley, spring wheat and soybeans. There seems to be a consistant decrease in the labor cost per acre and also in the horse power and machinery cost. The other expenses, consisting mostly of repairs and depreciation on buildings and fences, taxes and miscellaneous crop and livestock expenses, have remained about constant.

Organization and Purpose of the Farm Bureau-Farm Management Service

The Farm Bureau-Farm Management Service was first organized in this area during the latter part of 1924. Its purpose is to assist the cooperating farmers to keep such farm accounts as will enable them to study the efficiency with which they are conducting their farm business and to apply to their individual farms the

Table 7--Comparison of Six Years' Records
Averages of Farms in the Farm Bureau-Farm Management Service in Livingston, McLean, Tazewell and Woodford Counties.

Items	1925	1926	1927	1928	1929	1930
Number of farm records used	225	210	200	150	380	330
Rate earned on investment -	3.21	2.80	3.72	5.66	5.56	.97
Labor and management wage -	$-382.00	$-616.00	$ -46.00	$1084.07	$1003.00	$-1616.
Size of farms in acres - -	232.0	232.1	231.5	234.6	227.6	230.6
Value of land per acre- - -	$ 191.55	$ 192.24	$ 192.84	$ 189.47	$ 184.20	$ 184.64
Total investment per acre -	258.15	255.93	253.81	251.74	246.12	248.21
Gross receipts per acre - -	22.05	20.74	22.78	27.86	27.17	15.43
Total expense per acre- - -	13.77	13.57	13.33	13.60	13.49	13.01
Net receipts per acre - - -	8.28	7.17	9.45	14.26	13.68	2.42
Receipts and Net Increases	$5115.00	$4813.00	$5274.00	$6534.86	$6185.00	$ 3559.00
Grain less feeds purchased	1901.00	1961.00	2683.00	3321.89	2936.00	969.00
Miscellaneous- - - - - - -	105.00	69.00	75.00	85.26	77.00	87.00
Livestock - total- - - - -	3109.00	2783.00	2516.00	3127.71	3172.00	2503.00
Horses- - - - - - - - -	---	---	5.00	5.30	---	---
Cattle- - - - - - - - -	557.00	454.00	562.00	670.11	599.00	341.00
Dairy products- - - - -	346.00	353.00	380.00	469.47	611.00	583.00
Hogs- - - - - - - - - -	1845.00	1689.00	1247.00	1565.90	1579.00	1335.00
Sheep - - - - - - - - -	101.00	32.00	67.00	109.78	68.00	24.00
Poultry - - - - - - - -	118.00	121.00	110.00	137.02	133.00	66.00
Eggs- - - - - - - - - -	137.00	130.00	140.00	167.57	179.00	152.00
Bees- - - - - - - - - -	5.00	4.00	5.00	2.56	3.00	2.00
Productive Livestock Records						
Investment per acre- - - -	$ 9.62	$ 10.43	$ 10.28	$ 10.84	$ 10.45	$ 9.89
Returns per acre - - - - -	13.29	13.38	10.85	14.68	15.28	12.22
Feed used per acre - - - -	8.81	8.38	8.06	10.34	10.60	9.74
Returns per $100 feed used	150.77	159.70	134.57	141.97	144.00	126.00
Pounds of pork per acre	66.8	64.0	74.0	76.0	73.7	72.0
Bushels per Acre of Crops						
Corn - - - - - - - - - - -	55.3	51.3	42.0	53.0	46.2	36.1
Oats - - - - - - - - - - -	39.2	37.1	34.5	43.8	45.8	35.8
Winter wheat - - - - - - -	18.3	20.6	16.8	18.4	21.1	24.9
Percent of Tillable Land in						
Higher profit crops- - - -	58.2	60.1	59.9	60.8	61.4	61.9
Medium profit crops- - - -	9.8	7.4	13.2	15.1	13.9	13.4
Lower profit crops - - - -	32.0	32.5	26.9	24.1	24.7	24.7
Expenses per Acre of Farm						
Hired and home labor - - -	$ 6.85	$ 6.67	$ 6.58	$ 6.60	$ 6.48	$ 6.00
Horse power and machinery-	4.80	4.42	4.38	4.42	4.25	4.07
Other expenses - - - - - -	4.71	4.79	4.73	4.79	4.75	4.59
Farm produce used in home -	$ 430.21	$ 466.70	$ 439.15	$ 395.95	$396.00	$ 362.00

practices in farm organization and operation which have proved profitable on other farms of a similar type. The cooperators in the project are farm bureau members of Livingston, McLean, Tazewell, and Woodford counties. The project is an outgrowth of the regular farm management extension work begun in Tazewell county in 1915. Some work was done in all of the four counties in 1916.

In Woodford county from 30 to 100 farmers completed farm accounts each year from 1916 to 1921 and beginning in 1921 over 100 records have been closed annually. Farm management tours have played an important part in developing interest in the work. The growing number of farmers keeping records made it impossible for the College of Agriculture to give thru the regular extension work the assistance desired by the farmers. This situation led to the organization of the Farm Bureau-Farm Management Service.

About sixty farm bureau members in each of the four counties cooperated in the project for the three years of 1925, 1926 and 1927. About three-fourths of them continued during 1928 while an analysis of the records secured during the first three years was made. Beginning the latter part of 1928, the project was reorganized for the three-year period of 1929 to 1931 with about 400 farm bureau members who are quite evenly distributed in the same four counties. About three-fourths of the original cooperators continued in the service. The total annual cost is approximately $35 per farm per year. About one-half of the expense in this area is borne by the University of Illinois. This leaves a cost of about $17.50 per farm per year. The fee varies from $12.50 to $25 per year, depending on the size of the farm. In two of the counties, the Farm Bureaus pay a portion of each fee, while in two counties the cooperators pay the entire fee.

While financial accounts kept in this service are similar to those used in the extension project in farm accounting, the additional records regarding cropping systems, crop and livestock production and feeds fed to each class of livestock and the personal contact with and assistance from the fieldman make the work of much more value to individuals. Additional records of practices followed in the production of each kind of crop and livestock and in the use of labor and power and machinery also make the Farm Bureau-Farm Management Service of more value to the cooperators than is the extension project in farm accounting.

An advisory committee, composed of one representative from each county and the head of the Department of Farm Organization and Management plans and directs the work. This committee consists of G. F. Bennett, Livingston county, chairman; B. C. Kraft, McLean county; W. C. Somer, Tazewell county; and J. Frank Felter, Woodford county, who is secretary-treasurer. This committee employs the fieldmen from among those recommended by the University and is responsible to the cooperating farm bureaus for the custody and expenditure of the funds raised by the collection of the cooperator's fees. Each farm bureau collects the fees from its cooperating members and pays them over to the committee.

The fieldmen, Mr. J. B. Andrews for McLean and Tazewell counties and Mr. W. A. Herrington for Woodford and Livingston counties, spend all of their time working with the cooperators in this area. They make four or five regular trips to all the farms during the year and meet the cooperators another time in the farm bureau offices or other convenient places during January to check over the account books for the preceding year. On these visits they assist the men with their records and secure information about practices with crops and livestock. During the second and succeeding years they spend considerable time in studying over the annual report with each cooperator and give extra time to those who wish special service in the way of reorganizating some parts of the farm business.

The Farm Bureau-Farm Management Service throughout the state is under the

direct supervision of Mr. M. L. Mosher, assistant professor of Farm Organization and Management. He assists the local farm bureaus in organizing the groups of co-operators and helps the fieldmen in planning and carrying out their work. He also supervises summarizing the farm account books, analyzing the data and preparing the annual reports.

As head of the Department of Farm Organization and Management, Professor H. C. M. Case gives general supervision to all of the work of the project. He meets with the advisory committee and assists in the preparation of the annual reports and in planning different phases of the work.

The organization and satisfactory conduct of the project is made possible by the hearty support and assistance of the farm advisers and their assistants. The farm advisers who are now serving in their respective counties are S. G. Turner, Livingston county; Wilbur H. Coultas, McLean county; Ralph E. Arnett, Tazewell county; and H. A. deWerff, Woodford county.

Meeting Low Prices for Farm Products With Lower Production Costs

The following discussion prepared by R. R. Hudelson and H. C. M. Case of the Department of Farm Organization and Management makes up a part of the reports sent to all farmers in Illinois who have cooperated during 1930 in keeping farm accounts with the University of Illinois and their local county farm bureaus. Farm bureaus in 95 counties are cooperating in the work and reports from farm advisers indicate that approximately 3400 farmers are enrolled in the projects for 1931.

Recent indexes show that present prices of farm products are on the average about 10% below those of the pre-war period 1910-1914. In contrast to this, farmers are still paying about 40% more than pre-war prices for what they have to buy. We now have more than ten years of low farm prices behind us and little prospect for an early return to a stable level of much higher prices, although we may expect to recover partially at least from the recent extreme price drop caused by an acute business depression. In view of these facts the chief hope of the individual farm appears to be in lower costs of production. Some consideration of present costs relative to those of pre-war years and of the variation in costs from farm to farm should be worth while. A study of this nature should show some of the factors which have led to lower costs and higher earnings on those farms which have succeeded better than the average.

Numerous changes in methods of production have occurred since the first cost accounts were collected by the University in 1913. New kinds of equipment have come into general use. Farm wages have increased. New varieties of crops have been distributed. New practices with respect to soil maintenance as well as the selection and treatment of seeds have been introduced. New practices in livestock sanitation have been made available, particularly the inoculation for hog cholera and the McLean County system of hog sanitation. An analysis of the available accounts covering this eighteen-year period indicates that the adoption of tractors and larger machines has made some reduction in the amount of man labor and horse power required to produce an acre of crop. It also is evident that those farmers who have adopted the practical means of increasing crop and livestock yields have increased the amount of product per acre of land, per hour of labor, per unit of power or machinery, and per unit of feed.

In general, however, the average cost of producing an acre of corn or other crop has increased since the period 1913 to 1916, when records were secured from a group of farms in Hancock County in western Illinois and another group in Franklin County in southern Illinois.

Such reduction as has been secured in the amount of labor per acre of crop has been more than offset by higher wages and higher machinery costs. Such reduction in land charges per unit of product as would have resulted from larger yields has been offset by higher taxes and interest charges on higher priced land much of which is covered by an increased mortgage indebtedness.

The 1913-1916 average cost per acre of corn in Hancock County was $19.42 including interest on the investment in land at 5%. This cost increased to $26.69 in 1920-1922 when the records from that county

were discontinued. Similar records are available for Champaign and Piatt counties for 1920-1922 showing a cost to produce corn of $29.59 an acre. The records for Champaign-Piatt counties for 1927-1929 show some decline in acre cost but the average cost was still $26.39. If we assume the same decline for Hancock County the average cost would be $23.49 in 1927-1929 or $4.07 higher than in 1913-1916. The average price received for corn on the Hancock County farms where cost records were kept during the period 1913-1916 was 58 cents a bushel or about the same as it would bring today.

Similar figures for southern Illinois are found in the Franklin County records showing an average acre cost for corn of $15.61 in 1913-1916 rising to $27.65 in 1920-1922 when the records were discontinued. Similar records for Clinton County for 1926-1928 show a cost of $21.35 an acre. These records are kept on a comparable basis and bear out the statement that corn production costs are 20 to 35% higher than before the war, while corn prices are down to the pre-war level in spite of a short crop. The situation with respect to the small grains, wheat and oats, is even worse since present costs bear about the same relation to those of pre-war days as in the case of corn, while prices have declined to a level well below that of 1913-1916.

Some question may be raised as to the advisability of including the interest on land investment in these cost figures, but in many cases a considerable part of the interest charge represents an actual payment on mortgage indebtedness. When interest charges are eliminated it does not change the relationship of costs between pre-war and after-war periods. The most recent after-war figures remain considerably above those of 1913 to 1916.

This variation in cost of production from period to period is significant as indicating the greater difficulty in securing a net farm income comparable to that of pre-war days. Even when secured, the same money income does not buy as large a quantity of goods and services owing to the higher cost of these items purchased for the family living.

This appears to be a pessimistic view, but it is not without hope as eighteen years of cost studies on Illinois farms have shown. <u>These cost of production studies by the University of Illinois have shown a wide variation between neighboring farms in the cost of producing a bushel of grain, a hundred pounds of pork, or a unit of any other farm product</u>. In fact, these records commonly have shown that in any group of 15 to 20 farms located in the same county on similar soils and paying about the same prices for labor and supplies the cost of the least efficient producer is twice that of the most efficient producer. These facts indicate that many farm operators have the opportunity of decreasing their costs if they can attain a degree of efficiency equal to or above that of the average farm as farms are now operated.

Another view of this situation is furnished by the results from the simple farm accounts which more than two thousand Illinois farmers are now keeping in cooperation with the Department of Farm

Organization and Management of the University. In some cases, these accounts have been kept continuously on the same farms for fifteen years. The results from the large number of records available invariably show a wide variation in net earnings between farms in the same county where soil and weather conditions and the prices of labor and supplies are similar. Since the farmers in local areas studied commonly receive about the same prices for their products, it is evident that most of the higher level of earnings on the more successful farms is due to a lower cost of production for a unit of product sold. The difference in net earnings between the least successful third and the most successful third of all farms keeping accounts in a given county usually ranges from $1500 to $3000. This is between groups of farms which have equal opportunities so far as size and soil type are concerned.

Production at low cost is not easy and natural limitations of the farm or its operator may prevent its accomplishment in some cases. It offers, however, a genuine ray of hope for those farms not too badly handicapped by nature, particularly if they are in the hands of operators who are not content with average or lower success and who have the ability and perseverance to attain a high degree of efficiency. During the past 15 years the comparison between farms shows that the difference in earnings between the best and poorest farms is gradually becoming greater, due to the maintenance of soils and the adoption of more efficient practices on some farms contrasted with the depletion of soils and no compensating improvements in efficiency on others.

The past ten years have proved a severe testing period for farms. Those which have maintained relatively good and stable earnings are well worth studying with a view to learning how they are organized and operated. What is it that has enabled them to produce at costs low enough to leave a margin of profit in spite of low prices?

A study of these successful farms has shown that they are invariably in the hands of operators who have given time and thought to planning and conducting their farming operations so as to get a maximum of good quality product from every acre of land, every day of available labor, every unit of horse or tractor power, every machine, and every bushel of grain or ton of roughage. If we are to judge by the records from these farms it appears to be impossible to get a maximum of product from every unit of labor, land, power, equipment, or feed, if plans are not made with the best thought and the use of the best facts available or if these plans are laid only one season ahead. It is success in getting a maximum of product from each unit of cost which gives the low costs so necessary in these times of prevailing low prices.

Successful Farms Make Efficient Use of Land

To get a maximum net profit from each acre of land, these successful farms practically all have planned and carried out carefully considered cropping systems and soil programs. Crop rotations have been known and recommended for many years, but if we consider the rank and

file of farms just as they are, relatively few have adopted and carried them through. Yet we find that most of the consistently successful farms do have and follow rotations. Their rotations usually are such as to keep as much of the land as possible in those crops which normally have the widest margin between cost per acre and income per acre. They also supply enough organic matter and nitrogen to give high yields. With crops that have the highest net value and yields at a high level the land charge for each unit of sales is relatively low. This is such an important factor that it seems evident that many farms unable to produce reasonable yields of saleable crops are rapidly going out of use for crop production under present conditions of low prices and high costs. It is essential that the cost of taxes and other land charges be distributed to a large product per acre in order to keep the cost for a bushel or other unit of product at a low level.

Besides their cropping systems, these successful farms have had corrected the natural or acquired shortcomings of their soils. In Illinois this usually has meant a program of testing the soil and applying limestone or phosphate where needed. As a rule financial conditions have not permitted the satisfying of soil needs in a year or two but tests were made, the program planned, then carried out over a period of years.

The farm operator who only looks ahead a year at a time or who lacks the persistence to overcome obstacles seldom carries through such a program. It should be recognized also that some lands have such serious handicaps as to raise the question whether they should not be retired from crop production, rather than to incur the necessary costs for correction. The costs may be out of proportion to the income which such lands may be expected to yield when their remediable faults have been overcome. The practical question is whether or not such lands will yield enough crops so that at probably prices they will pay annual operating costs plus a sum equal to the interest and retirement charges on the cost of improvement. The increase over the yield of the same land uncorrected may be large enough to pay for the cost of improvement and still the yields may be definitely too low to pay operating costs plus improvement costs. In such cases the land is better retired before incurring the expense for improvement.

Further steps in securing efficient use of land have included (1) the use of crop varieties capable of yielding a maximum of good quality product under the particular soil and weather conditions, (2) the guaranteeing of healthy, vigorous seed through seed testing, (3) the avoiding of insect and disease losses through such control measures as are now known to those who follow the work of our agricultural experiment stations. Much land is wasted in a field with a poor stand of crop, and this unoccupied land must be charged to the crop growing on the occupied portion of the field. This means a high cost for land. These unoccupied spaces also waste labor, power, and equipment since they must be tended and yield no product.

Labor, Power, and Equipment Used Efficiently

Getting low costs for labor, for power and for equipment can best be brought into one plan. Such a plan involves the selection of a well balanced cropping system which uses available labor, power, and equipment through as many months as possible avoiding extremely heavy periods of demand. These heavy demand periods make necessary the hiring of extra labor at the highest priced seasons, such as harvest time; the use of inexperienced labor and the carrying of excessive amounts of work stock or equipment for use during short seasons.

Labor, power and equipment are in some degree interchangeable. During the past 25 years the problem of choosing the best combination of these factors to suit each individual farm has become more complex and more difficult. This has been due to the introduction of new kinds of power and equipment, and to changes in the level of farm wages. During and since the war period relatively high wages have stimulated the substitution of power and equipment for a part of the labor formerly used. This was done by equipping each man with a larger unit of power and with machines capable of doing more work per day. So long as the increased cost of power and machinery is offset by a reduced labor cost either through hiring less labor or turning out more saleable product per day of labor the shift is justified. It is probable, too, that in some cases the extra costs for power and equipment are offset by increased yields resulting from more timely soil preparation and crop planting. This improvement in yields is not evident from our analysis of farm accounts, however, and probably should be considered as a minor factor in determining the best combination of labor, power, and equipment. Decisions as to the purchase of new units of horse or tractor power or new machines should be based largely on the combined costs for labor, power, and equipment. Costs may well be estimated with and without these items.

Consideration should, of course, be given to the quantity and value of the product to be expected in each case. In other words, it is the effect on the net income of the entire farm business which should determine the choice. Sometimes a machine or unit of power is purchased to use on too small an enterprise. Where the cost of the new equipment or unit of power is relatively large, it may be advisable (1) to discontinue the enterprise, (2) care for it with the equipment already owned, (3) enlarge the size of the enterprise so that its income may justify the new equipment, or (4) purchase equipment in cooperation with neighboring farmers.

Getting efficient use of labor, power, and equipment also requires a good field layout and a reasonably good arrangement of buildings and lots. Planning and arranging a good field layout is avoided on too many farms because it is difficult where there are ditches or other obstructions. Experience has shown that it is possible on most farms, however, and its costs are chiefly represented in thinking and labor which can be done in those seasons when time can best be spared from seasonal work.

Any plan for labor and power efficiency should also include a plan for winter employment at productive work. For most of the successful farms on which we have secured accounts, this has meant the use of livestock. Those farms without livestock or other productive enterprises requiring winter work have a considerable season when the available labor and power are not turning out any saleable product. The wages of labor for this time and the interest and depreciation on horses or tractors must be charged to the product of the crop growing season. This increases the cost of crops produced.

Successful Farms Secure a Maximum of Product From Each Unit of Feed

One of the most important factors causing higher earnings on the more successful farms has been that of getting a high return for each unit of feed fed. Since the farms in any local accounting study have about the same market outlets this has meant that those farms securing this higher net return are producing meat, milk, and eggs at lower costs. In other words, they are getting a large amount of saleable product from each $100 worth of feed. How do they do it? First, they have the kind of livestock that can use the feeds they raise, and they see to it that these livestock are efficient in converting feed into meat or milk as the case may be. In recent years a big advancement has been made in the efficiency of the best strains of hogs, dairy cows, and other kinds of livestock in converting feed into livestock products. This has meant more product per unit of feed or lower feed costs for meat, milk and eggs. Second, those farmers showing higher, more stable earnings, have planned and used systems of sanitation to insure vigorous health and rapid growth. They have realized that feed fed to unthrifty animals is wasted. Third, they know that in feeding they must supply feeds in about the right proportions to make the meat or milk they are after. An excess of one feed with a shortage of another means a waste of the feed which is fed in excess. Wastes mean high cost because the wasted feed must be charged to the product. Fourth, in most cases they practice feeding home grown feeds because they know that their own feeds usually are cheaper than similar feeds grown by some other producer and shipped to them accumulating freight and handling charges. To have the right feed, however, requires looking ahead and planning. The cropping system and the kinds and numbers of livestock must be balanced against each other.

An Example of a Low Cost Farm

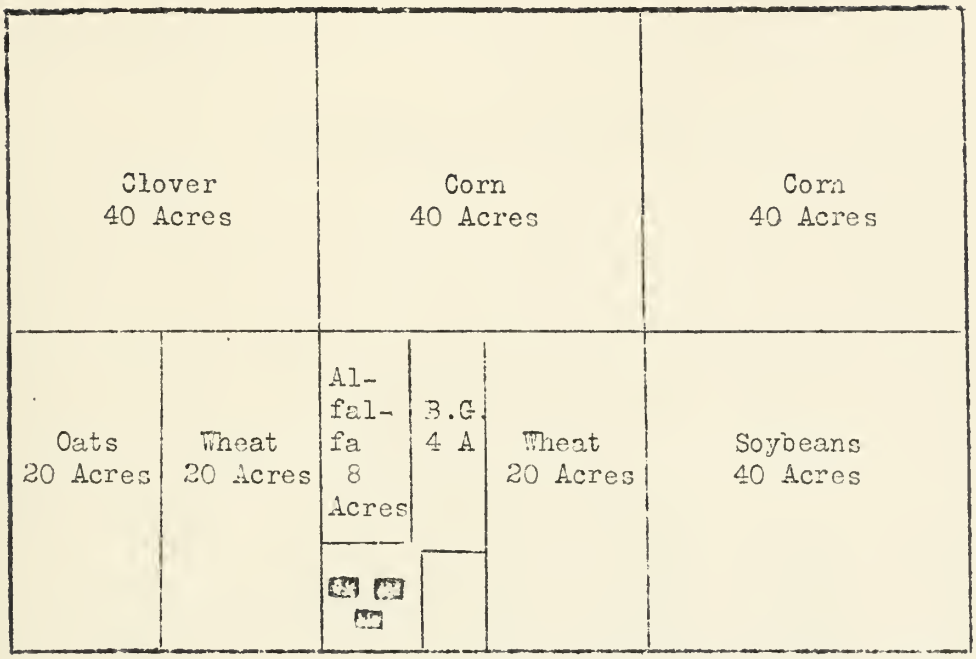
As an example of what has been accomplished by an efficient, low cost production program, the following charts covering a farm in Champaign County are presented. This farm has been in the standard farm accounting service for seven years and has averaged 6⅔% on the total farm investment for the seven years 1924 to 1930 inclusive. The land is valued at $190 an acre. There are some farms which show a higher average rate earned but this is one of the most consistently profitable farms on which we have complete cost accounts, The farm is of good size and shape with a good field layout and cropping system as shown in Chart 1. It has as livestock enterprises dairy cows, hogs, and

chickens as shown on Chart 2. For power there is an old three bottom tractor and 6 work horses. The general plan of organization is systematic and efficient, conforming rather well to the principles here presented. The hog enterprise with only two to three brood sows is too small to show a very high degree of efficiency when measured by cost records. As Chart 3 shows, pork constitutes the only product which on this farm is produced at higher than average cost. Much of the labor and some of the equipment would take care of a larger number of brood sows with little increase in cost. The farm is flat around the farmstead, however, and not very well adapted to hogs. The milk is sold through a producers marketing association in Champaign and Urbana. It is picked up at the farm. The other products including corn, oats, soybeans and hogs are sold through the local elevator or in the case of hogs, shipped through a local shipping association. The work is planned ahead and carried out in a timely manner so far as the season permits.

The results have been reflected in comparatively stable earnings on a relatively high level as the average rate of 6⅓% for seven years shows. That the relatively high earnings are due chiefly to low costs of production is evident from the cost records, results of which are shown in Chart 3. This chart is made up with the production cost of the highest cost farm at the bottom of each thermometer scale, the cost of the lowest cost farm at the top of each scale, the cost for the average farm on the middle line, and with the "Mercury" of the thermometers indicating the cost on this well organized Champaign County farm.

The charts and other records bring out very clearly what has been found true of nearly all those farms which are known to be succeeding well above the average farm, namely, that they are well planned and efficiently operated. Chart 3 shows that an important reason for the success of this farm is that it produces at low cost. So long as farm prices seem destined to remain on a low level, this is an important observation and farms such as this one which have succeeded above the average through the trying period since the war are worth studying by those who are responsible for operating farms.

Chart No. 1--FIELD PLAN AND CROPPING SYSTEM
240 ACRE FARM IN CENTRAL ILLINOIS

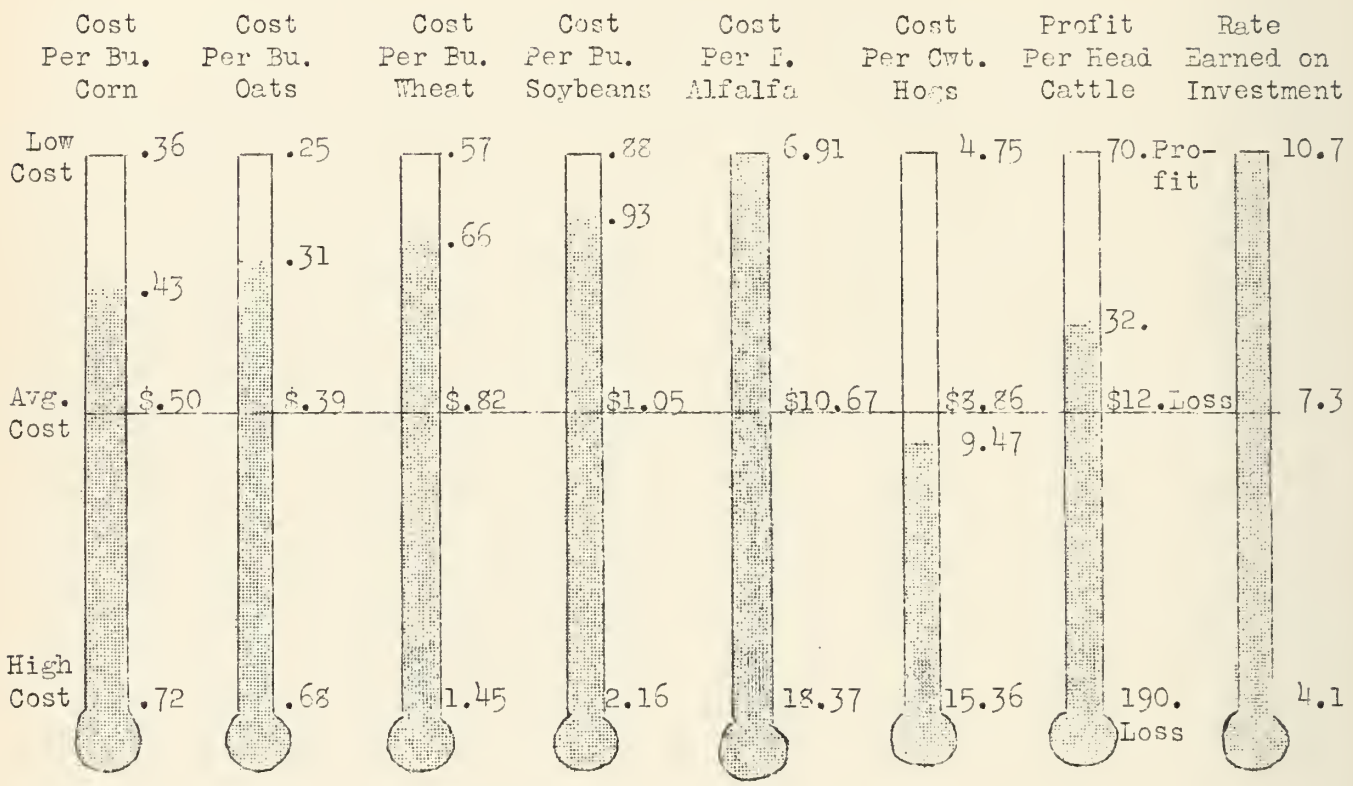


Farm No. 43 Cost Route 1929

Chart No. 2--LIVESTOCK NUMBERS AND INCOME ON THE ABOVE FARM

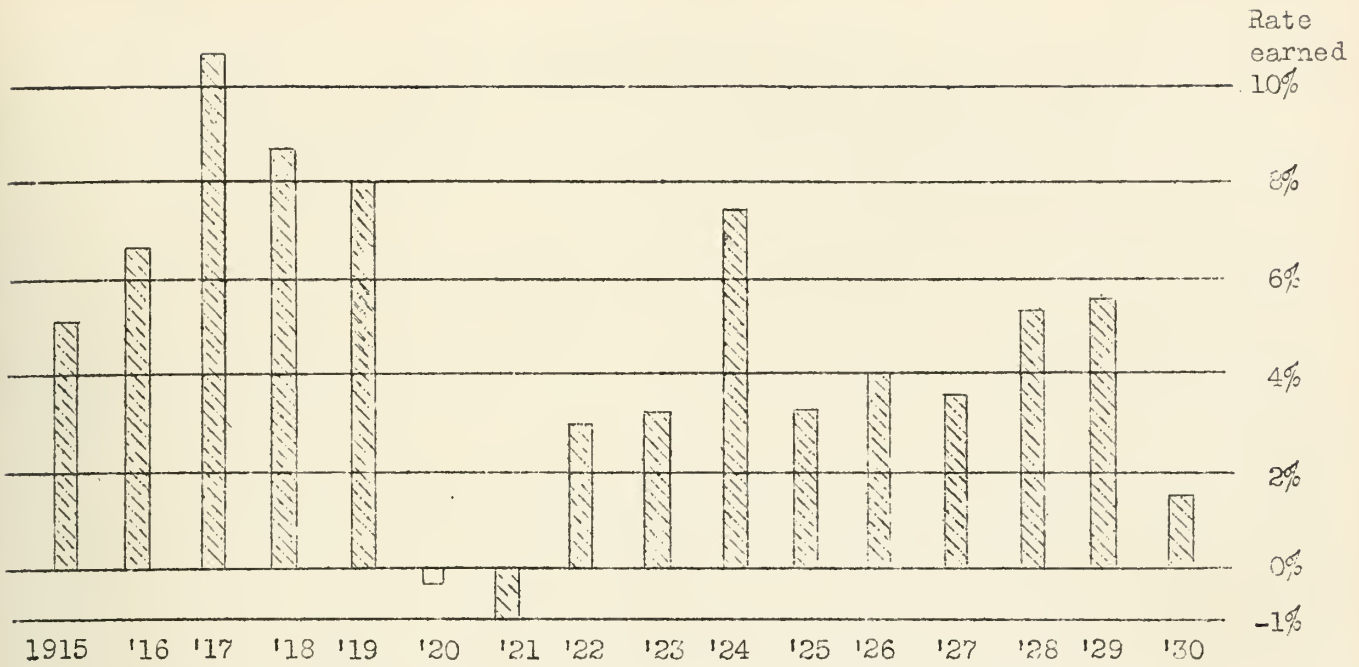
	Numbers	Income
Horses		
Mature	6	
Colts	2	
Cattle		
Dairy cows	7	
Heifers	3	
Calves	3	
Bull	1	
Milk produced	64944 lbs.	
Total income from cattle		$1973
Hogs		
Sows	3	
Shoats	13	
Total income from hogs		437
Chickens		
Total income from poultry	120	425
Total income from livestock		$2835

Chart No. 3--RELATIVE COSTS OF PRODUCTION ON
21 CHAMPAIGN COUNTY FARMS-1929

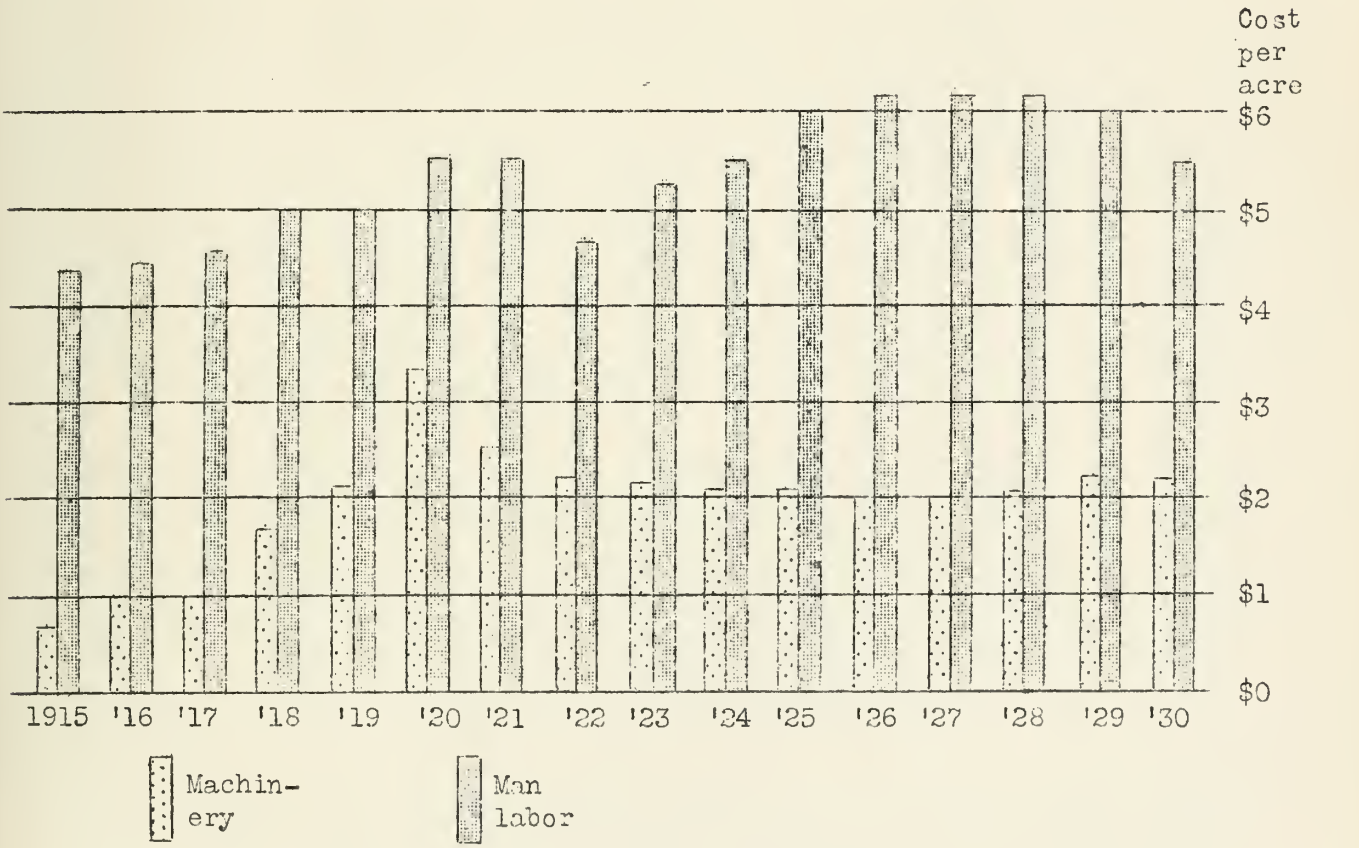


The top of each thermometer represents the cost of production of the most efficient producer among the 21 Champaign county farmers keeping cost accounts in 1929. The bottom of the scale represents the highest cost or least efficient producer. The "mercury" in each thermometer represents the cost of production on the farm discussed on pages 13 and 14 and shows how one farm efficiently organized and operated has secured a low cost on practically all of its products. Low costs have enabled this farmer to earn 6½ percent on his total farm investment as an average of the six years 1924 to 1930 inclusive.

Chart No. 4



Rate earned on the total farm investment on farms of account keepers in central Illinois for years 1915 to 1930. Repeated checks have indicated that the average farmer earns a rate about 2% less than that of the average account keeper.



Labor and machinery costs per acre on farms of account keepers in east central Illinois for each year from 1915 to 1930 inclusive. Both labor and machinery charges are considerably higher than before the war but the relative increase in machinery costs is greater.

Printed in furtherance of the Agricultural Extension Act approved by Congress May 8, 1914, H. W. Mumford, Director.

SEVENTH ANNUAL REPORT OF THE FARM BUREAU-FARM MANAGEMENT SERVICE FOR THE FARMS OF 315 COOPERATORS ON THE HIGHER VALUED LAND IN* LIVINGSTON, MCLEAN, TAZEWELL, AND WOODFORD COUNTIES FOR THE YEAR 1931

J. B. Andrews, W. A. Herrington, M. L. Mosher, H. C. M. Case

Farm earnings for the state of Illinois as a whole were materially lower in 1931 than in 1930. Earnings in 1930 were lower than for any year since 1921.

There was an average net loss of $550 per farm in 1931 on the 315 farms included in this report. (Table 3.) All of these farms are on the more productive land of central Illinois. There was an average net income of $558 per farm in 1930 for the investment, for risk and for management on the farms in this area as is shown in the Sixth Annual Report for 1930. About 40 of the 380 farms included in the 1930 report are on the less productive land of the area.* This indicates a drop in net income of about $1100 per farm in 1931 as compared with 1930.

The decrease in earnings was due to the drastic slump in the general price level of all commodities which was accompanied by an even more drastic slump in the prices of farm products. It is characteristic of periods of rapid decline in the general price level that prices of farm products decrease faster than prices of manufactured goods. In like manner farm prices recover first on an up-turn in the general level. The drop in farm prices has not been due to over-production since the total production of agricultural products in this country has not increased during the last five years while the population has increased 7%. The effective demand for agricultural products has been low during 1931 both at home and abroad. In this country there was a decline of 50% in the amount of money paid city workers as compared with the year 1929. Since city workers had so little money to spend, farm products were taken from the market at ruinously low prices. The foreign demand for farm products was also low due to the generally unsettled economic conditions which prevail all over the world at the present time.

The decline in the price of farm products influences farm account records in two ways: The value of products sold during the year is reduced and the inventory value of livestock and grains is less at the end of the year than at the beginning. In a period of declining prices earnings appear lower when inventory values are taken into account than when calculated solely on a cash basis. Inventory losses were responsible for low earnings on many farms in 1931. The farms with large beginning inventories of feed and livestock suffered more than farms with small inventories.

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*The 315 farms included in this report are all on the higher valued land of the area. Most of the tillable land on these farms is of the brown silt loam soil type. The records of 37 other farms on the lower valued land in these counties are included with records of farms on similar land in other areas in a special report entitled, "Report of the Farm Bureau-Farm Management Service for 125 Farms on the Lower Valued Land of Central Illinois."

Other industries than farming suffered a slump in 1931. The earnings of a group of 900 industrial corporations reported by the National City Bank of New York showed in 1931 a decline of 53% from 1930 and a decline of 72% from 1929. The average rate of return on the capital invested in these corporations was 13.4% in 1929, 7.1% in 1930, and 3.3% in 1931. The small volume of business done by these corporations in 1931 had a detrimental effect on the demand for farm products. In like manner the small volume of machinery, building materials, and clothing purchased by farmers in 1931 had a detrimental effect on the volume of business done by these corporations. A rapid decline in the general price level brings about maladjustments which are painful to all parties concerned.

In comparing the earnings of farms with the earnings of corporations, two differences must be kept in mind: (1) corporations pay for management through their salaries to officers and executives while in the farm accounts no deduction has been made for the value of management, and (2) the farmer and his family receive foods, fuel, and shelter from the farm for which no credit is given in the calculation of rate earned on investment.

Variation in Earnings from Farm to Farm

Although, on an average, the farms in this study failed to return enough to pay for the operator's labor at hired man's wages and returned nothing for the use of the capital invested in the business, there was considerable variation among the farms in this respect. The distribution of the farms on the basis of the net income per farm was as follows:

Net income on investment	Number of farms
$2 249 to $1 750	2
1 749 to 1 250	8
1 249 to 750	10
749 to 250	29
249 to - 249*	70
- 250 to - 749	67
- 750 to -1 249	72
-1 250 to -1 749	38
-1 750 to -2 249	6
-2 250 to -2 749	7
-2 750 to -3 249	5
-3 250 or less	1

A comparison of the 63 farms having the highest rate earned on the investment with the 63 farms having the lowest rate earned is shown in the tables on the following pages. A summary showing the general locations of some of the differences in earnings between the two groups may be found on page 19.

* A minus sign indicates a net loss.

Farms on the Higher Valued Land of Livingston, McLean, Tazewell and Woodford Counties, 1931

Table 1--Investments, Receipts, and Expenses

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
Capital investments				
Land	$	$45 796	$47 394	$40 186
Farm improvements		5 996	5 600	6 071
Livestock--Total		2 852	2 815	2 757
Horses		631	595	622
Cattle		1 265	1 373	1 217
Hogs		721	559	718
Sheep		86	116	57
Bees		8	21	8
Poultry		141	151	135
Machinery and equipment		2 263	2 234	2 065
Feed, grain and supplies		2 810	2 630	2 672
Total capital investment	$	$59 717	$60 673	$53 751
Receipts and net increases				
Livestock--Total	$	$ 1 604	$ 1 979	$ 1 207
Horses		---	---	---
Cattle		180	131	190
Hogs		792	707	655
Sheep		26	48	15
Bees		2	11	---
Poultry		70	90	40
Egg sales		110	132	98
Dairy sales		424	860	209
Feed, grain and supplies		535	1 233	---
Labor off farm		56	105	51
Miscellaneous receipts		17	29	11
Total receipts and net increases	$	$ 2 212	$ 3 346	$ 1 269
Expenses and net decreases				
Farm improvements	$	$ 287	$ 258	$ 319
Horses		38	15	75
Miscellaneous livestock		---	---	---
Machinery and equipment		478	405	482
Feed, grain and supplies		---	---	125
Livestock expense		48	49	54
Crop expense		204	203	189
Hired labor		387	459	395
Taxes		515	522	475
Miscellaneous expenses		54	54	56
Total expenses and net decreases	$	$ 2 011	$ 1 965	$ 2 170
Receipts less expenses	$	$ 201	$ 1 381	$ -901

Farm Earnings

There was an average net loss for investment, risk, and management amounting to .92% of the total capital invested on the 315 farms. The 63 most profitable farms had average net incomes of $646 a farm while the 63 least profitable farms had average net losses of $1619 a farm. There was a difference of $2265 a farm between the net incomes on the one-fifth most profitable and the net losses on the one-fifth least profitable farms. The net income from investment and management is the balance after deducting the value of the operator's and unpaid family labor, based on wages paid hired labor, from the receipts less expenses.

The figures given in the upper part of Table 3 help make clear that the receipts less expenses shown on the bottom line of Table 1 include changes in inventories as well as the cash balance for the year. The cash balance for the year is what the bank balance would show if all farm sales for the year had been deposited in one account and all farm expenses had been paid by checks on that account. The receipts less expense is the balance when the change in inventories is combined with the cash balance for the year.

The average cash balance for the 315 farms was $1735 but decreases of $1534 a farm in inventories brought the receipts less expense down to $201. A more complete study of the inventory changes may be made from Table 2. It may be noted that most of the inventory decrease was in livestock and in feed, grain and supplies. The decrease of $158 in farm improvements and $163 in machinery and equipment indicates that farm improvements and machinery and equipment are being allowed to deteriorate.

Table 2--Changes in Farm Inventories

Items	Average of 315 farms		63 most profitable farms		63 least profitable farms	
	First of year	End of year	First of year	End of year	First of year	End of year
Land	$45 796	$45 796	$47 394	$47 394	$40 186	$40 186
Farm improvements	5 996	5 838	5 600	5 480	6 071	5 900
Total livestock	2 852	2 314	2 815	2 436	2 757	2 145
Machinery and equipment	2 263	2 100	2 234	2 079	2 065	1 925
Feed, grain and supplies	2 810	2 135	2 630	2 164	2 672	1 889
Total inventories	$59 717	$58 183	$60 673	$59 553	$53 751	$52 045

The family living furnished by the farm, when figured at the wholesale prices for which the products could have been sold, amounted to $291 a farm or $62 a person in the farm family. This item may be considered as labor income for the farm operator and other members of the family in addition to the labor wages deducted in the accounts.

Farm Expenses

There was an average total expense of $11.50 per acre for the 315 farms. Of this amount, 16 cents was for net decreases in the horse account. This leaves $11.34 an acre, expense for the items usually included with operating expenses. The same items of expense amounted to $12.92 an acre for farms in the same area in 1930.

Farms on the Higher Valued Land of Livingston, McLean, Tazewell and Woodford Counties, 1931

Table 3--Farm Earnings

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
RATE EARNED ON INVESTMENT	%	-.92 %	1.06 %	-3.01%
Inventories--beginning of year	$	$59 717	$60 673	$53 751
Inventories--end of year		58 183	59 553	52 045
Change in inventories		-1 534	-1 120	-1 706
Total cash sales during year		4 203	4 965	3 436
Total cash expenses during year		2 468	2 464	2 631
Cash balance for year		1 735	2 501	805
Receipts less expenses		201	1 381	-901
Total unpaid labor		751	735	718
Operator's labor		572	567	579
Family labor		179	168	139
Net income from investment and management		-550	646	-1 619
Return to capital and operator's labor and management		22	1 213	-1 040
5% of capital invested		2 986	3 034	2 688
Labor and management wage		-2 964	-1 821	-3 728
Net income per acre		-2.29	2.59	-7.67
Family living furnished by farm				
Farm products used in home	$	$ 291	$ 277	$ 289
Number in family		4.7	4.3	5.0
Farm produce used per person	$	$ 62	$ 65	$ 58

Table 4--Farm Expenses

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
Total expense per acre of farm	$	$ 11.50	$ 10.81	$ 13.68
Common operating expenses		11.34	10.75	12.74
Farm improvements		1.19	1.03	1.51
Machinery and equipment		1.99	1.62	2.28
Miscellaneous livestock expense		.20	.20	.26
Miscellaneous crop expense		.85	.81	.90
Hired and home labor		4.74	4.78	5.27
Taxes		2.15	2.09	2.25
Miscellaneous		.22	.22	.27
Livestock and grain decreases		.16	.06	.94
Horses		.16	.06	.35
Miscellaneous livestock		---	---	---
Feed, grain and supplies		---	---	.59
EXPENSE PER $100 GROSS INCOME	$	$ 125	$ 81	$ 228

Size of Business

The standard of living of the farm family is largely dependent on the net income of the farm business over a period of several years. Even though a farm may be very efficiently operated, the total size or volume of business may be so small as to give an inadequate income. A fair to large size of business is therefore necessary if a good standard of living is to be provided for the farm family.

The total number of man work units per farm is probably as good a measure of size of business as can be applied to these records. A man work unit is a measure of the average amount of farm work done by a man in one 10 hour day. The amounts of work done in a 10 hour day used in calculating the number of man work units of labor performed on these farms are based on detailed cost records kept during several years on about 20 Champaign and Piatt County farms. A more complete statement of standards used in this analysis is shown on page 16.

The care of all the crops and livestock on one of the 315 farms in this study called for only 161 man work units of work while another amounted to 1131 man work units. The numbers of farms having varying amounts of work to do were as follows:

Man work units per farm	Number of farms
100 to 199	6
200 to 299	45
300 to 399	93
400 to 499	76
500 to 599	55
600 to 699	21
700 to 799	9
800 to 899	6
900 to 999	2
1000 or more	2

Other measures of size of business are shown in Table 5. Man work units is preferred over other measures of size of business shown in Table 5 because it takes into account the differences in kinds of crops grown and the differences in kinds and amounts of livestock.

Intensity of Business

A fairly large volume of business may be done on a small sized farm by following an intensive type of farming such as dairying, poultry raising or truck farming. Where farms are so nearly uniform as to soil type and natural productiveness as these, the number of man work units required per acre of the farm becomes a fairly good measure of intensity of business. A study of the records shows that the man work units per acre varied from 1.16 on one large grain farm to 4.05 on an 80 acre farm on which most of the income was from dairy products. The average of all the 315 farms produced crops and livestock requiring 1.83 man work units of work per acre. The farms varied as shown in the table on the left. Other measures that indicate intensity of farm business are shown in Table 6.

Man work units per acre	Number of farms
1.10 to 1.29	9
1.30 to 1.49	33
1.50 to 1.69	70
1.70 to 1.89	67
1.90 to 2.09	52
2.10 to 2.29	35
2.30 to 2.49	20
2.50 to 2.69	14
2.70 to 2.89	4
2.90 to 3.09	6
3.10 to 3.29	3
3.30 to 3.49	1
3.50 or more	1

Organization of Farm Business and Sources of Income

The general organization of the farm as regard to farm improvements, machinery and equipment and amount of livestock kept is indicated by the investments per acre. It may be noted in Table 7 that the 63 more profitable farms have considerably less invested per acre in farm improvements, machinery and equipment and productive livestock than do the less profitable farms.

Farms on Higher Valued Land of Livingston, McLean, Tazewell and Woodford Counties, 1931

Table 5--Size of Business

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
SIZE OF FARM--TOTAL ACRES- - - - -		240.3	249.7	211.1
Acres of tillable land - - - - - -		220.7	226.8	193.8
Acres in crops (crop acres)- - - -		196.0	205.3	166.7
Value of feed to productive live-stock - - - - - - - - - - - - - - -	$	$ 1 549	$ 1 469	$ 1 565
TOTAL MAN WORK UNITS - - - - - - -		439.0	468.0	377.8
Total investments- - - - - - - - -	$	$59 717	$60 673	$53 751
Total receipts and net increases -		2 212	3 346	1 269

Table 6--Intensity of Business

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
GROSS INCOME PER ACRE- - - - - - -	$	$ 9.21	$ 13.40	$ 6.01
Feed used per acre of farm - - - -		6.45	5.88	7.41
Pounds of pork produced per acre -		84.5	70.9	86.7
Man work units per acre- - - - - -		1.83	1.87	1.79

Table 7--Organization of Farm Business and Sources of Income

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
Investments per acre--total- - - -	$	$ 248.55	$ 242.97	$ 254.63
Real estate- - - - - - - - - - - -		215.55	212.23	219.12
Land - - - - - - - - - - - - - -		190.60	189.80	190.36
Farm improvements- - - - - - - -		24.95	22.43	28.76
Operating capital- - - - - - - - -	$	$ 33.00	$ 30.74	$ 35.51
Horses - - - - - - - - - - - - -		2.63	2.38	2.95
Productive livestock - - - - - -		9.25	8.88	10.12
Machinery and equipment- - - -		9.42	8.95	9.78
Feed, grain and supplies - - -		11.70	10.53	12.66
Percent of income from				
Horses - - - - - - - - - - - - -		---	---	----
Cattle--beef or stock- - - - - -		8.1	3.9	15.0
Hogs - - - - - - - - - - - - - -		35.8	21.1	51.6
Sheep- - - - - - - - - - - - - -		1.2	1.4	1.2
Poultry and eggs - - - - - - - -		8.1	6.7	10.8
Dairy products - - - - - - - - -		19.2	25.7	16.5
Feed,grain and supplies- - - - -		24.2	36.9	---
Miscellaneous- - - - - - - - - -		3.4	4.3	4.9

The organization of the business is also shown by the source of income. It may be noted in Table 7 that the more profitable farms had much less income from beef cattle and more from dairy products than did the less profitable farms. They also had considerable net increase in the feed and grain account while the low profit farms had a net decrease in the feed and grain account as shown in Table 1, page 3.

Yield of Crops

Ordinarily crop yields have more to do with net farm incomes than any other factor except possibly livestock efficiency. In this regard the year 1931 proved the exception in this area. It will be noted in Table 8 that the yields of grain and hay were not much different on the two groups of farms. The more profitable group of farms did have an advantage of 2.8 bushels of corn per acre over the less profitable farms. The heavy inventory decreases on many of the farms having high yields in 1930 largely offset the benefits of the good production in 1931. However, good yields secured by following practices that require low cash costs will continue to result in larger farm incomes.

Bu. per acre of corn	Number of farms
22.5 to 27.4	2
27.5 to 32.4	2
32.5 to 37.4	12
37.5 to 42.4	42
42.5 to 47.4	72
47.5 to 52.4	105
52.5 to 57.4	55
57.5 to 62.4	21
62.5 to 67.4	2
67.5 to 72.4	2

The yields of corn on these 315 farms, all of which are on good corn land, varied from 23.0 bushels to 71.8 bushels per acre. The numbers of farms with different yields were as shown on the left.

Organization of the Cropping System

The percent of tillable land in the higher profit crops of corn, winter wheat, alfalfa, canning crops and sweet clover for pasture as contrasted to the amount in the low profit crops of oats, timothy and bluegrass on tillable land has proved a fair measure of the profitableness of the cropping system. Giving half as much credit for the medium profit crops that include other small grains, soybeans, and the ordinary clovers as for the high profit crops, one finds that on the average farm 64.2% of the tillable land was in the higher profit crops.

Percent of tillable land in higher profit crops	Number of farms
35.0 to 39.9	1
40.0 to 44.9	1
45.0 to 49.9	5
50.0 to 54.9	11
55.0 to 59.9	22
60.0 to 64.9	45
65.0 to 69.9	58
70.0 to 74.9	61
75.0 to 79.9	59
80.0 to 84.9	34
85.0 to 89.9	11
90.0 to 94.9	5
95.0 to100.0	2

The percent of high profit plus one-half the medium profit crops varied fron only 38.7% on one farm to 100.0% on another as shown on the left.

It may be noted that there was about three and one-half times as much land in miscellaneous crops on the high profit farms as on the less profitable ones. Most of these crops were canning crops of sweet corn, peas and pumpkins. They contributed much to the income on some of the farms in 1931.

Farms on Higher Valued Land of Livingston, McLean, Tazewell, and Woodford Counties, 1931

Table 8--Yield of Crops and Cropping System

Crops grown	Profitableness of crop	Yield per acre: Your farm	Yield per acre: Aver. of 315 farms	Yield per acre: 63 most profitable farms	Yield per acre: 63 least profitable farms	Percent of tillable land in crops: Your farm	Percent of tillable land in crops: Aver. of 315 farms	Percent of tillable land in crops: 63 most profitable farms	Percent of tillable land in crops: 63 least profitable farms
Grain									
Corn	high	____	48.4	49.0	46.2		49.9	50.1	48.2
Oats	low	____	49.1	47.8	47.5		19.1	19.1	19.5
Winter wheat	high	____	26.2	26.5	25.9		4.4	3.9	4.7
Spring wheat	med.	____	21.2	23.0	18.1		1.8	2.5	1.2
Barley	med.	____	34.5	32.7	36.3		2.5	2.3	2.1
Soybeans	med.	____	23.7	21.0	29.1		2.4	1.3	1.7
Miscellaneous							.7	.5	1.0
Hay									
Timothy	low		1.2	1.2	1.4		.3	.2	.5
Clover	med.		1.1	1.1	1.1		1.4	1.3	1.6
Alfalfa	high		2.7	2.8	2.5		2.2	2.5	1.9
Clover and timothy	med.		1.5	2.3	1.0		.3	.3	.3
Soybeans	med.		2.0	2.0	1.9		1.5	1.7	1.7
Miscellaneous							.2	.2	.4
Miscellaneous crops							2.1	4.6	1.3
Pasture									
Bluegrass	low						2.1	1.6	3.0
Timothy	low						.9	.5	.8
Clover	med.						.7	.5	.8
Sweet clover	high						3.4	2.8	4.6
Clover and timothy	med.						.9	1.0	.7
Sweet clover mixed	high						2.4	1.6	3.5
Alfalfa	high						.2	.3	.1
Miscellaneous							.6	1.2	.4
Percent of tillable land in									
All high profit crops							64.2	65.3	63.7
All medium profit crops							13.0	13.0	11.8
All low profit crops							22.8	21.7	24.5
ALL HIGH PLUS ONE-HALF MEDIUM PROFIT CROPS						____	70.7	71.8	69.6
Legumes left down for year							16.6	16.3	17.9
Crop following first year sweet clover plowed under							3.6	3.0	1.5

Amounts of Productive Livestock

The value of feed fed per acre to productive livestock gives an idea of the relative importance of the livestock enterprise to the net farm income. The total amount of feed fed to and the total returns from productive livestock indicate the total size of the livestock enterprise. In the analysis in Table 9 the total returns from each class of livestock include the products used on the farm as well as those sold. The feed used on these 315 farms varied from 18 cents an acre on one farm to $36.62 an acre on another. The numbers of farms using different amounts of feed were as follows:

Feed per acre	Number of farms
$ .00 to $ 1.99	12
2.00 to 3.99	75
4.00 to 5.99	83
6.00 to 7.99	56
8.00 to 9.99	36
10.00 to 11.99	22
12.00 to 13.99	9
14.00 to 15.99	10
16.00 to 17.99	2
18.00 to 19.99	4
20.00 to 21.99	3
22.00 to 23.99	1
24.00 or more	2

Unless it was unusually well handled, a large amount of livestock was not an advantage as far as net income on the investment was concerned in 1931. It may be noted in Table 9 that there was $7.41 worth of feed per acre used on the less profitable group of farms and only $5.88 worth used on the more profitable farms. It is shown also that there were more farms with beef cattle and fewer farms with dairy cattle on the less profitable farms.

Efficiency of Productive Livestock

Efficiency of livestock production as measured by the returns for each $100 of feed fed apparently had more affect than any other one factor on net farm incomes in this area in 1931. Six farms had less than $50 returns for each $100 worth of feed fed, while twelve others each gave $210 or more total return for each $100 of feed used. The 315 farms ranged as follows in this factor:

Returns per $100 feed to livestock	Number of farms
$ 30 to $ 49	6
50 to 69	18
70 to 89	28
90 to 109	67
110 to 129	68
130 to 149	52
150 to 169	34
170 to 189	17
190 to 209	13
210 to 229	5
230 to 249	2
250 to 269	2
270 to 289	1
290 or more	2

It will be noted in Table 10 that there was an average return of $148 for $100 worth of feed fed to all productive livestock on the more profitable farms and only $90 return for $100 feed on the less profitable group. This same relation is seen in case of each kind of livestock.

It may well be noted that there was an average of 110.0 eggs produced per hen on the more profitable farms and only 98.5 eggs per hen on the less profitable group. There were 6 pigs weaned per litter and 100 pounds of pork produced with only 393 pounds of feed on the more profitable farms, while 5.8 pigs were weaned per litter and 446 pounds of feed were used for each 100 pounds gain on the less profitable farms. The milk production was 805 pounds more per cow on the more profitable farms and the total dairy returns amounted to $50 more per cow.

Farms on Higher Valued Land of Livingston, McLean, Tazewell, and Woodford Counties, 1931

Table 9--Amount and Efficiency of Productive Livestock*

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
Total feed to all productive livestock	$	$ 1 549	$ 1 469	$ 1 565
Beef cattle		877(96)	829(11)	848(25)
Mixed cattle		544(132)	685(31)	406(21)
Dairy cattle		446(82)	561(20)	513(16)
Hogs		803(296)	647(55)	809(58)
Sheep		121(109)	146(26)	99(23)
Poultry		93	111	92
TOTAL FEED USED PER ACRE	$	$ 6.45	$ 5.88	$ 7.41
Total returns from productive livestock	$	$ 1 821	$ 2 180	$ 1 411
Beef cattle		702(96)	1 023(11)	454(25)
Mixed cattle		715(132)	1 112(31)	374(21)
Dairy cattle		668(82)	1 169(20)	458(16)
Hogs		875(296)	770(55)	757(58)
Sheep		74(109)	107(26)	40(23)
Poultry		239	284	194
Total returns per acre				

Table 10--Efficiency of Productive Livestock

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
Returns per $100 feed fed to				
All productive livestock	$	$ 118	$ 148	$ 90
Beef cattle		80	123	54
Mixed cattle		131	162	92
Dairy cattle		150	208	89
Hogs		109	119	94
Sheep		62	73	40
Poultry				
Returns per $100 invested		184	203	160
Number of hens--average for year		109.1	114.4	104.3
Number of eggs per hen--average		102.0	110.0	98.5
Hogs				
Pounds of pork produced		20 310	17 707	18 310
Returns per 100 lbs. pork	$	$ 4.13	$ 4.17	$ 3.84
Feed cost per 100 lbs. pork		3.79	3.52	4.10
Pounds of feed per 100 lbs. pork		417	393	446
Pigs weaned per litter		6.1	6.0	5.8
Dairy cows				
Number of cows milked		5.9	8.1	4.5
Pounds of milk per milk cow		6 839	7 108	6 303
Dairy returns per milk cow	$	$ 90	$ 118	$ 68

*A figure in parenthesis designates the number of farms which that item represents.

Labor and Power and Machinery Efficiency

On one farm the work in caring for the crops and livestock should have required only 129.8 days for each man working on the farm, while on another farm the acres of crops and amounts of livestock cared for would normally require 430.1 days of labor per man. See page 16 for a discussion of the standards by which the man work units are calculated. This great difference in the amount of work accomplished per worker on different farms is shown on the left side below.

Man work units per man	Number of farms
110 to 139	3
140 to 169	20
170 to 199	41
200 to 229	70
230 to 259	81
260 to 289	56
290 to 319	22
320 to 349	7
350 to 379	11
380 to 409	2
410 to 439	2

Horse and machinery efficiency index 1/	Number of farms
40 to 59	8
60 to 79	49
80 to 99	80
100 to 119	79
120 to 139	51
140 to 159	29
160 to 179	6
180 to 199	3

1/ Includes mechanical power.

Above on the right side is shown the distribution of farms according to the Horse and Machinery Efficiency Index. The horse and machinery efficiency index for any farm is calculated by finding the number of acres of crops worked on that farm with the same horse and tractor power and machinery cost with which 100 acres of crops are worked on the average farms of the same size and having the same amounts of livestock feeding to do. This enables each cooperator to compare his horse and machinery efficiency with that of other farms of the same size as his and with those having like amounts of work with livestock.

The table on page 17 will enable each cooperator to determine whether a high or low cost for horse power and machinery is caused by high or low costs of operating his truck, auto, tractor, other machinery or horses.

Amounts and Prices of Some Products Sold

Differences in prices received for products sold had some influence in placing farms in the high or low groups. On some farms products on hand were sold before large price declines had taken place, and some farms were favored by special markets for at least part of their products. The range in average prices of all six products listed in Table 12 is shown on the left.

Percent of average price received	Number of farms
60.0 to 69.9%	1
70.0 to 79.9%	10
80.0 to 89.9%	39
90.0 to 99.9%	112
100.0 to 109.9%	99
110.0 to 119.9%	36
120.0 to 129.9%	11
130.0 to 139.9%	4
140.0 to 140.9%	0
150.0 or more	3

Farms on Higher Valued Land of Livingston, McLean, Tazewell, and Woodford Counties, 1931

Table 11--Labor and Power and Machinery Costs

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
Labor				
MAN WORK UNITS PER MAN	____	238.6	250.3	213.4
Average number of men		1.84	1.87	1.77
Labor cost per crop acre	$	$ 5.67	$ 5.57	$ 6.52
POWER AND MACHINERY				
Horse and machinery efficiency index	____	100.0	116.8	88.5
Percent of farms with tractors		82.9	84.1	79.4
Percent of farms with trucks		40.6	41.3	34.9
Average number of workable horses		6.03	5.83	6.17
Value of feed fed to horses	$	$ 235	$ 226	$ 223
Feed cost per workable horse		39	39	36
Costs per crop acre				
Horse feed and depreciation	$	$ 1.39	$ 1.18	$ 1.79
Machinery		2.44	1.97	2.89
Horses and machinery		3.83	3.15	4.68
Labor, horses and machinery		9.50	8.72	11.20

Table 12--Amounts and Prices of Some Products Sold

Items	Your farm	Average of 315 farms	63 most profitable farms	63 least profitable farms
Amounts sold				
Corn--bushels		2 013	2 217	1 386
Oats--bushels		928	951	721
Wheat--bushels		251	271	223
Pork--pounds		19 344	16 432	17 274
Milk--pounds		43 200	63 260	30 884
Eggs--dozens		595	580	569
Prices received				
Corn--cents per bushel	$	$ .44	$ .47	$ .42
Oats--cents per bushel		.21	.21	.21
Wheat--cents per bushel		.49	.49	.54
Pork--dollars per 100 lbs.		5.84	5.84	5.81
Milk--dollars per 100 lbs.		1.33	1.81	1.17
Eggs--cents per dozen		.18	.19	.18
PERCENT OF AVERAGE PRICE RECEIVED FOR ALL	____ %	100.0 %	112.0 %	97.0 %

Explanation of the Farm Efficiency Chart
(See Chart on page 15)

The figure in any column just above the double line across the middle of the chart is for the middle farm of all the farms to which that factor applies.

The figure in any column just above the top single line across the chart represents approximately the most efficient farm in the factor named at the top of that column. The figure at the bottom of each column of the chart represents approximately the least efficient farm in that factor.

The figure in any column just above the second from the bottom line across the chart represents approximately the most efficient of the one-fifth of the farms which are lowest in that factor. It also represents approximately the least efficient in the next to the lowest one-fifth of the farms in that factor.

Likewise, the figure in any column just above the next to the top line across the chart represents approximately the least efficient of the one-fifth best farms in that factor. It also represents approximately the most efficient of the second to the best one-fifth group of the farms in that factor. The other lines separate the middle group in each factor from the groups next to it.

By drawing a line across each column at approximately the place which represents the efficiency of his farm in each factor and then, by filling in with a colored crayon or pencil the space below such lines, a cooperator can see clearly where his farm stands in efficiency in each factor.

Table 13--Relation of Rate Earned on Investment to Number of Factors in Which Farms Excel

Number of factors in which farms excel	Number of farms	Rate earned
10	1	+ .31
9	7	- .17
8	37	+ .62
7	45	- .07
6	47	- .27
5	53	-1.20
4	47	-1.51
3	34	-2.04
2	27	-2.27
1	16	-2.59
0	1	-1.70

The following ten factors were used in the analysis shown in the table above: expense per $100 gross income, gross receipts per acre, man work units per farm, yield of corn, percent of land in higher profit crops, feed fed per acre to productive livestock, returns per $100 feed to all productive livestock, man work units per man, horse and machinery efficiency index, and percent of average price received. Thirty-seven farms that were above the average in eight of ten factors averaged .62% on the investment. Sixteen were above the average in only one factor. They averaged a net loss of 2.59% of their investment.

The value of well balanced farming in which all parts of the business are done at least fairly well is clearly shown in this table.

Farm Efficiency Chart

(See page 14 for an explanation of the use of this chart)

Rate earned on investment	Expense per $100 gross income	Gross receipts per acre	Man work units per farm	Bushels per acre: Corn	Bushels per acre: Oats		Percent land in higher profit crops	Feed per acre to productive livestock	Returns per $100 feed to productive livestock: cattle	Hogs	Sheep	Poultry*	All productive livestock	Man work units per man	Horse and machinery efficiency	Percent of average prices received
5.0	50	32	1000	70	74		100	25		200	200	440	280	400	190	165
The best one-fifth of the farms in each factor come between this line and the next line below.																
.2	96	13	541	54	58		79	10		137	105	252	155	278	130	109
The second best one-fifth of the farms in each factor come between this line and the next line below.																
-.5	111	11	457	50	52		74	7		117	62	191	130	248	111	102
-.9	126	10	410	48	50		71	6		108	52	169	120	238	100	100
-1.3	137	9	375	47	47		69	5		100	39	151	110	225	94	98
The second lowest one-fifth of the farms in each factor come between this line and the next line below.																
-2.2	175	7	313	43	41		63	3		81	16	111	92	198	81	91
The lowest one-fifth of the farms in each factor come between this line and the bottom line.																
-5.0	425	3	170	25	20		40	1		0	-100	0	35	130	45	70

*Returns for $100 invested used for poultry.

Analysis of Horse Power, Mechanical Power, and Machinery Costs

Horse power, mechanical power and machinery costs on corn-belt farms make up a larger part of all farm operating costs than any other single item except labor. It has been difficult for many who have cooperated in the Farm Management Service to see wherein their horse and machinery costs were particularly high or low. In order to analyze these costs more completely the farms have been grouped according to size of farm and use of tractor and truck in Table 15. The data include that from 521 farms in the Farm Management Service on the higher valued lands in Grundy, LaSalle, Marshall, Putnam, Henry, Knox, Peoria and Stark Counties and the counties included in this report. The records were all thrown together so as to make the averages more dependable.

By comparing the records of his farm with the average of other farms of the same size and having the same type of power and equipment as his, each cooperator may locate rather definitely the places that his horse and machinery costs are particularly high or low. The information in this table is presented only for the purpose indicated. Data for only one year on so small a number of farms as appear in some of the groups are not considered sufficient from which to draw conclusions regarding the relative profitableness of farming with or without tractors or trucks, or on different sizes of farms.

Man Work Units Per Man, A Measure of Labor Efficiency

The measure of labor efficiency used in this report is the average number of man work units worked per man during a full year of 12 months. A man work unit is a measure of the average amount of work done in one 10 hour day. The amounts of work done in a 10 hour day used in calculating the number of man work units of labor performed on these farms are based on detailed cost records kept during the four years of 1926, 1927, 1928, and 1929 on about 20 farms in Champaign and Piatt Counties and on dairy enterprise studies in north central Illinois for 1928 and 1929.

Table 14--Standards for Calculating Man Work Units

Crops			Livestock		
Kind of crop	Man hours per acre	Man work units per acre	Kind of livestock	Man hours per animal unit	Man work units per animal unit
Corn	13.3	1.33	Cattle other than cows milked	22.0	2.2
Oats	6.5	.65	Cows milked by hand	124.2	12.4
Wheat (winter)	10.2	1.02	Cows milked with machine	94.6	9.5
Wheat (spring)	7.7	.77	Hogs (per 100 pounds produced)	2.7	.27
Rye	10.2	1.02			
Barley	7.1	.71			
Soybeans	10.9	1.09			
Alfalfa	13.1	1.31	Sheep	31.6	3.16
Clover	7.6	.76	Poultry	207.5	20.75
Timothy	6.4	.64	Horses	48.9	4.89
Soybean hay	15.9	1.59			
Sweet corn 1/	13.3	1.33			
Canning peas 1/	12.0	1.20			
Truck crops 1/	100.0	10.00			

1/ Estimates

Table 15--Analysis of Horse Power, Mechanical Power, and Machinery Costs

Items	Your Farm	Farms under 180 acres			Farms of 180 to 299 acres			Farms of 300 acres or more		
		With tractor and truck	With tractor without truck	Without tractor or truck	With tractor and truck	With tractor without truck	Without tractor or truck	With tractor and truck	With tractor without truck	Without tractor or truck
Number of farms		53	75	38	105	112	20	60	55	3
Investments										
Truck	$	$ 256	$ ---	$ ---	$ 255	$ ---	$ ---	$ 315	$ ---	$ ---
Auto		185	171	152	197	243	133	190	168	230
Tractor		458	459	---	564	587	---	853	688	---
Other machinery		1312	1052	812	1616	1330	942	2286	1706	1185
All machinery		2211	1682	964	2632	2160	1075	3644	2562	1415
Horses		369	407	562	571	546	663	772	791	1115
Horses and machinery		2580	2089	1526	3203	2706	1738	4416	3353	2530
Expenses and net decreases										
Truck	$	$ 90	$ ---	$ ---	$ 80	$ ---	$ ---	$ 108	$ ---	$ ---
Auto		77	76	81	93	105	91	94	83	104
Tractor		116	140	---	189	182	---	281	259	---
Other machinery		161	132	104	203	189	147	295	256	199
Total machinery cost		444	348	185	565	476	238	778	598	303
Horse feed and depreciation		184	185	268	235	255	308	329	338	406
Machinery and horse cost		628	533	453	800	731	546	1107	936	709
Labor cost		859	787	721	1094	1078	976	1514	1467	1347
Labor, machinery & horse cost		1487	1320	1174	1894	1809	1522	2621	2403	2056
Expenses per acre of crops										
Machinery	$	$ 3.73	$ 2.99	$ 1.83	$ 2.94	$ 2.56	$ 1.46	$ 2.46	$ 2.03	$ 1.11
Horse feed and depreciation		1.55	1.59	2.65	1.22	1.37	1.88	1.04	1.15	1.49
Machinery and horses		5.28	4.58	4.48	4.16	3.93	3.34	3.50	3.18	2.60
Labor		7.22	6.75	7.14	5.69	5.79	5.96	4.78	4.98	4.96
Labor, machinery & horses		12.50	11.33	11.62	9.85	9.72	9.30	8.28	8.16	7.56
Total acres in farm		146.7	144.2	132.6	236.3	227.9	209.2	400.9	372.2	313.3
Acres in crops		118.9	116.5	101.0	192.3	186.1	163.7	316.6	294.5	271.8
Feed per acre to livestock	$	$ 9.57	$ 9.43	$ 4.43	$ 7.17	$ 7.36	$ 5.40	$ 7.05	$ 6.79	$ 8.28

In Table 14, page 16 is given the standard number of hours of man labor required throughout the year to care for one acre of each crop or for an animal unit of each kind of livestock. In this study, one animal unit consists of one mature horse or cow, 2 colts or calves or yearling cattle in the breeding herd, 2 feeder cattle, 5 mature sheep, 10 to 15 lambs or feeder sheep and 100 hens. The number of each class of livestock was calculated for each farm by taking the average of the numbers on hand at the beginning and at the end of the year.

Value of Farm Products Used in the Farm Home

The amounts of farm products used in the homes of the cooperators have been estimated and recorded from month to month. The average total value of such products at the farm selling prices amounted to $291 per farm for the 315 farms on which such records were kept, as shown in the table on this page.

The prices used were approximate wholesale farm prices as follows: milk, 10 cents per gallon, or about $1.15 per 100 pounds; cream, 11 cents per pint; butter, 30 cents per pound; eggs, 18 cents per dozen; poultry and other meats, live weight farm price at the time slaughtered; and potatoes 50 cents per bushel. The value of other vegetables was estimated according to the size and quality of the garden and the number of persons in the family during the garden season. This estimate was based on studies made in former years by the Department of Farm Organization and Management in connection with detailed cost account investigations. Fifteen cents per quart was used in case of all vegetables and fruits produced on the farm and canned or preserved for winter use.

The value of these farm products used in the home was not included in the farm receipts as shown in Table 1, page 3. However, the values of the poultry and livestock products were included in the returns from each class of livestock in figuring the livestock efficiency factors as shown in Table 9, page 11.

Table 16--Amounts and Value of Farm Products Used in the Farm Home
Average 315 Farms, 1931

Product	Amounts	Wholesale farm price	Wholesale farm value
Fuel	---	---	$ 1
Milk	320 gal.	$.10	32
Cream	173 pts.	.11	19
Butter	90 lbs.	.30	27
Eggs	194 doz.	.18	35
Poultry	---	---	26
Beef	---	---	6
Pork	761 lbs.	.064	49
Honey	---	---	1
Potatoes	18 bu.	.50	9
Other vegetables	---	---	44
Fresh fruits	---	---	6
Canned fruits and vegetables	240 qts.	.15	36
Total	---	---	$291

Location of Differences in Incomes Between the More Profitable and the Less Profitable Farms

Much of the difference of $2430 in the average net earnings between the 63 most profitable and the 63 least profitable farms is accounted for in Table 17.

Quality of land. The 315 farms used in this report are all on the better corn lands of these four counties. In a few cases there is some rough pasture land in addition to the good farm land. It is shown in Table 7, page 7, that the average value of land in the two groups of farms was almost the same. The proportions of tillable land and of tillable land in crops were also approximately the same. (Table 5, page 7.)

Inventory changes. There was more decrease of inventories on the less profitable than on the more profitable farms. This is discussed on page 4. Inventory changes affecting factors other than feed and grain enter into the data shown in Table 17.

Efficiency of livestock. The 63 more profitable farms realized $148 from each $100 worth of feed fed to productive livestock while the 63 least profitable farms received only $90 or a difference of $58 for each $100 worth of feed used. The average amount of feed used on all farms was valued at $1549 at farm prices. The larger returns for each $100 of this feed used on

Table 17--Location of Differences in Incomes Between the 63 Most Profitable and the 63 Least Profitable Farms

Factors considered	Average difference
Efficiency of livestock	$ 898
Cost of power and machinery	264
Cropping system	257
Crop yields	214
Miscellaneous expenses	202
Cost of man labor	137
Prices of grain	88
Amount of livestock	-66
Total located differences	$1994
Difference in net incomes--4.07% of average capital	$2430

the more profitable farms accounts for $898 difference in average gross income between the two groups of farms. This does not include the cost of keeping horses on the two groups of farms. About 60% of the grain produced on these farms was fed, the rest being sold as grain. In areas where more of the grain is fed on the farms, livestock efficiency becomes relatively more important.

Cost of power and machinery. The total cost per acre of horse and tractor power, and machinery on the most profitable farms amounted to only $2.59 per acre compared with $3.69 on the least profitable farms. This difference of $1.10 an acre would amount to $264 less cost per farm in favor of the more profitable farms.

Cost of man labor. The total labor cost, including the operator's and family labor at hired man rates, was $4.58 an acre on the 63 more profitable farms and $5.15 on the less profitable ones. This difference of 57 cents an acre applied to the average size of all farms amounts to $137.

Miscellaneous expenses. Expenses other than for labor, power and machinery amounted to $4.35 and $5.19 an acre on the high and low groups of farms respectively. This difference of 84 cents an acre accounted for $202 difference in expense on the two groups of farms.

Cropping system. This analysis is based on the data giving the acreages, yields and values of all crops grown on these farms, most of which are given in Table 8, page 9. The advantage that the more profitable farms had because of a better cropping system amounted to $257. Most of the advantage that the high profit farms had over the low profit farms as to cropping system was in having larger acreages in the canning crops of sweet corn, peas and pumpkins.

Prices of grain. It is shown in Table 12, page 13, that the more profitable farms received as an average five cents a bushel more for corn, the same for oats, and five cents less for wheat than the less profitable farms. These differences, applied to the amounts sold on the average of all farms, show a total difference of $88 in favor of the more profitable farms.

The difference of three cents per 100 pounds of pork in favor of the more profitable farms applied to the 19,344 pounds average sales amounts to $6. The difference of 64 cents per 100 pounds of milk applied to the 43,200 pounds average production amounts to $276. A similar difference of one cent a dozen for 595 dozens of eggs amounts to $6. This total of $288 advantage because of better prices of hogs, dairy products and eggs is not shown in Table 17 as a separate item because it is a part of the $898 advantage that the better farms had because of better efficiency of livestock.

Crop yields. Most years differences in yields of crops account for much of the differences between the more and less profitable groups of farms. However, in 1931, the larger inventory losses more frequently occurred on farms having high production in 1930, and this tended to offset the advantages of good yields in 1931. Consequently it is seen in Table 8, page 9, and in Table 17, page 19, that there was an advantage of only $214 because of better yields on the more profitable farms in 1931.

Amount of livestock. There was more feed fed to livestock on the less profitable group than on the more profitable group of farms. This has not proved true in former years, and it is the result, mainly, of the marked decline during the year in the inventory value of beef cattle and hogs on hand at the beginning of the year. A study of the records for 1931 and for other recent years shows that livestock must be efficiently handled if it is to be raised and fed with a profit.

Comparison of Seven Years' Records

The figures in the first column of Table 18 are averages for the three years of 1925, 1926, and 1927. The 315 records for 1931 do not include about 40 farms on lower-valued land that were included in the reports of earlier years. The farms on the lower valued land are included in another report as indicated in the note on page 1.

The extent to which the general depression has affected corn-belt agriculture is indicated by the drop in farm receipts less expenses from $4282 a farm in 1928 to $201 a farm in 1931. While there was a drop during those four years of $18.65 an acre in gross receipts, there was a decrease of only $2.10 an acre in total expense.

Table 18--Comparison of Seven Years' Records
Farms in Farm-Bureau Farm Management Service in
Livingston, McLean, Tazewell and Woodford Counties

Items	Average 1925-6-7	1928	1929	1930	1931*
Number of farms*	175	150	380	380	315
Rate earned on investment	3.34%	5.66%	5.56%	.97%	-.92%
Labor and management wage	$-296	$1084	$1003	$-1616	$-2964
Receipts less expenses	2958	4282	4023	1463	201
Cash balance for year	3297	3336	3315	2884	1735
Change in inventories	-339	+946.	+708	-1421	-1534.
Gross receipts per acre	22.36	27.86	27.17	15.43	9.21
Total expense per acre	13.68	13.60	13.49	13.01	11.50
Net receipts per acre	8.68	14.26	13.68	2.42	-2.29
Size of farm in acres	232.3	234.6	227.6	230.6	240.3
Value of land per acre	$195.12	$189.47	$184.20	$184.64	$190.60
Farm improvements per acre	24.41	24.88	24.60	24.35	24.95
Machinery investments per acre	8.19	8.53	8.24	9.17	9.42
Total investment per acre	259.99	251.74	246.12	248.21	248.55
Receipts and net increases--total	$5194	$6535	$6185	$3559	$2212
Feed, grain and supplies	2211	3322	2936	969	535
Cattle	560	670	599	341	180
Dairy products	347	469	611	583	424
Hogs	1654	1566	1579	1335	792
Sheep	71	110	68	24	26
Poultry and eggs	266	305	312	218	180
All other income	85	93	80	89	75
Bushels per acre of					
Corn	49.7	53.0	46.2	36.1	48.4
Oats	37.4	43.8	45.8	35.8	49.1
Winter wheat	19.7	18.4	21.1	24.9	26.2
Barley	----	29.7	28.3	23.6	34.5
Percent of tillable land in					
High profit crops	59.9	60.8	61.4	61.9	64.2
Medium profit crops	8.7	15.1	13.9	13.4	13.0
Low profit crops	31.4	24.1	24.7	24.7	22.8
Feed per acre to productive livestock	$ 9.04	$ 10.34	$ 10.60	$ 9.74	$ 6.45
Returns per $100 feed to					
All productive livestock	$151	$ 142	$ 144	$ 126	$ 118
Beef cattle	99	133	120	92	80
Hogs	163	127	134	128	109
Pounds of pork per acre	73.1	76.0	73.7	72.0	84.5
Pounds of milk per milk cow	---	---	6166	6574	6839
Eggs per hen	84.9	92.5	94.0	93.5	102.0
Hired and home labor per crop acre	$ 8.36	$ 8.27	$ 8.14	$ 7.29	$ 5.67
Man work units per man	---	---	---	232.1	238.6
Horse and machinery per crop acre	5.65	5.54	5.35	5.07	3.83

*Records of 37 farms on the lower valued land of the area were not included in this summary in 1931. Such farms are included among the farms for other years.

Increased efficiency during the period is shown by the increase in percent of tillable land in higher profit crops, in the larger number of eggs produced per hen and the increase in pounds of milk produced per cow.

Organization and Purpose of the Farm Bureau-Farm Management Service

The Farm Bureau-Farm Management Service was first organized in this area during the latter part of 1924. Its purpose is to assist the cooperating farmers to keep such farm accounts as will enable them to study the efficiency with which they are conducting their farm business and to apply to their individual farms the practices in farm organization and operation which have proved profitable on other farms of a similar type. The cooperators in the project are farm bureau members of Livingston, McLean, Tazewell, and Woodford Counties. The project is an outgrowth of the regular farm management extension work begun in Tazewell County in 1915. Some work was done in all of the four counties in 1916.

In Woodford County from 30 to 100 farmers completed farm accounts each year from 1916 to 1921 and beginning in 1921 over 100 records have been closed annually. Farm management tours have played an important part in developing interest in the work. The growing number of farmers keeping records made it impossible for the College of Agriculture to give through the regular extension work the assistance desired by the farmers. This situation led to the organization of the Farm Bureau-Farm Management Service.

About 60 farm bureau members in each of the four counties cooperated in the project for the three years of 1925, 1926 and 1927. About three-fourths of them continued during 1928 while an analysis of the records secured during the first three years was made. Beginning the latter part of 1928, the project was reorganized for the three-year period of 1929 to 1931 with about 400 farm bureau members who are quite evenly distributed in the same four counties. About three-fourths of the original cooperators continued in the service. The total annual cost is approximately $35 per farm per year. About one-half of the expense in this area is borne by the University of Illinois. This leaves a cost of about $17.50 per farm per year. The fee varies from $12.50 to $25 per year, depending on the size of the farm. In two of the counties, the farm bureaus paid a portion of each fee, while in two counties the cooperators paid the entire fee.

While financial accounts kept in this service are similar to those used in the extension project in farm accounting, the additional records regarding cropping systems, crop and livestock production and feeds fed to each class of livestock and the personal contact with and assistance from the fieldman make the work of much more value to individuals. Additional records of practices followed in the production of each kind of crop and livestock and in the use of labor and power and machinery also make the Farm Bureau-Farm Management Service of more value to the cooperators than is the extension project in farm accounting.

An advisory committee, composed of one representative from each county and the head of the Department of Farm Organization and Management plans and directs the work. During the past year this committee has consisted of G. F. Bennett, Livingston County, chairman; B. C. Kraft, McLean County, W. C. Somer, Tazewell County; and J. Frank Felter, Woodford County, who is secretary-treasurer. This committee employs the fieldmen from among those recommended by the University and is responsible to the cooperating

farm bureaus for the custody and expenditure of the funds raised by the collection of the cooperator's fees. Each farm bureau collects the fees from its cooperating members and pays them over to the committee.

The fieldmen, Mr. J. B. Andrews for McLean and Tazewell Counties and Mr. W. A. Herrington for Woodford and Livingston Counties, have spent all of their time working with the cooperators in this area. They made four or five regular trips to all the farms during the year and met the cooperators another time in the farm bureau offices or other convenient places during January to check over the account books for the preceding year. On these visits they assisted the men with their records and secured information about practices with crops and livestock. During the second and succeeding years they spent considerable time in studying over the annual report with each cooperator and gave extra time to those who wished special service in the way of reorganizing some parts of the farm business.

The Farm Bureau-Farm Management Service throughout the state is under the direct supervision of Mr. M. L. Mosher, assistant professor of Farm Organization and Management. He assists the local farm bureaus in organizing the groups of cooperators and helps the fieldmen in planning and carrying out their work. He also supervises summarizing the farm account books, analyzing the data and preparing the annual reports.

As head of the Department of Farm Organization and Management, Professor H. C. M. Case gives general supervision to all of the work of the project. He meets with the advisory committee and assists in the preparation of the annual reports and in planning different phases of the work.

The organization and satisfactory conduct of the project is made possible by the hearty support and assistance of the farm advisers and their assistants. The farm advisers who are now serving in their respective counties are S. G. Turner, Livingston County; R. J. Laible, McLean County; Ralph E. Arnettt, Tazewell County; and H. A. deWerff, Woodford County.

Farm Practices That Pay

Much of the data regarding crops and livestock practices collected by the fieldmen in this and other areas during the years of 1925 to 1930 inclusive, have been analyzed. It appears with other data based on 18 years work of the Department of Farm Organization and Management in Circular 389 of the Agricultural Experiment Station entitled, "Farm Practices That Pay". This circular may be had free of charge by addressing a request for it to the Agricultural Experiment Station, University of Illinois, Urbana, Illinois.

It is suggested that each cooperator secure a copy of this circular and study is carefully. It will help to answer the questions about how the men who get best results along different lines do their work.

Printed in furtherance of the Agricultural Extension Act
approved by Congress May 8, 1914, H. W. Mumford,
Director Extension Service
University of Illinois

REPORT OF THE FARM BUREAU-FARM MANAGEMENT SERVICE FOR THE FARMS OF 125 COOPERATORS ON THE LOWER VALUED LANDS IN NORTH CENTRAL ILLINOIS FOR THE YEAR 1931*

J. B. Andrews, W. A. Herrington, F. A. Fisher,
J. B. Cunningham, M. L. Mosher, H. C. M. Case

Farm earnings for the state of Illinois as a whole were materially lower in 1931 than in 1930. Earnings in 1930 were lower than for any year since 1921.

There was an average net loss of $530 per farm in 1931 on the 125 farms included in this report. (Table 3). The average net loss was $558 a farm on all the 740 farms on the higher and lower valued lands in the Farm Bureau-Farm Management Service. There was an average net income of $809 per farm in 1930 for the investment, for risk and for management on 703 farms in this area as is shown in the Annual Farm Business Reports for 1930. This indicates a drop in net income of $1367 per farm in 1931 as compared with 1930.

Other industries than farming suffered a slump in 1931. The earnings of a group of 900 industrial corporations reported by the National City Bank of New York showed in 1931 a decline of 53% from 1930 and a decline of 72% from 1929. The average rate of return on the capital invested in these corporations was 13.4% in 1929, 7.1% in 1930, and 3.3% in 1931. The small volume of business done by these corporations in 1931 had a detrimental effect on the demand for farm products. In like manner the small volume of machinery, building materials, and clothing purchased by farmers in 1931 had a detrimental effect on the volume of business done by these corporations. A rapid decline in the general price level brings about maladjustments which are painful to all parties concerned.

In comparing the earnings for farms with the earnings of corporations, two differences must be kept in mind: (1) corporations pay for management through their salaries to officers and executives while in the farm accounts no deduction has been made for the value of management, and (2) the farmer and his family received foods, fuel, and shelter from the farm for which no credit is given in the calculation of rate earned on investment.

The decrease in earnings was due to the drastic slump in the general price level of all commodities which was accompanied by an even more drastic slump in the prices of farm products. It is characteristic

*The 125 farms included in this report are all on the lower valued lands of Henry, Knox, Peoria, Stark, Grundy, LaSalle, Marshall, Putnam, Livingston, McLean, Tazewell, and Woodford counties. Most of the land on these farms is of the yellow or yellow-gray silt loam or sandy loam soil types. The records of 615 other farms on the higher valued lands in these counties are included in other reports of the Farm Bureau-Farm Management Service for 1931.

of periods of rapid decline in the general price level that prices of farm products decrease faster than prices of manufactured goods. In like manner farm prices recover first on an up turn in the general level. The drop in farm prices has not been due to over-production, since the total production of agricultural products in this country has not increased during the last 5 years while the population has increased 7%. The effective demand for agricultural products has been low during 1931 both at home and abroad. In this country there was a decline of 50% in the amount of money paid city workers as compared with the year 1929. Since city workers had so little money to spend, farm products were taken from the market at ruinously low prices. The foreign demand for farm products was also low due to the generally unsettled economic conditions which prevail all over the world at the present time.

The decline in the price of farm products influences farm account records in two ways: the value of products sold during the year is reduced and the inventory value of livestock and grains is less at the end of the year than at the beginning. In a period of declining prices, earnings appear lower when inventory values are taken into account than when calculated solely on a cash basis. Inventory losses were responsible for low earnings on many farms in 1931. The farms with large beginning inventories of feed and livestock suffered more than farms with small inventories.

Variation in Earnings from Farm to Farm

Although, on an average, the farms in this study failed to return enough to pay for the operator's labor at hired man's wages and returned nothing for the use of the capital invested in the business, there was considerable variation among the farms in this respect. One farm had a net income of $1581 and another a net loss of $3168. Including the average decline of $1328 in the inventory value of livestock and crops as shown in Tables 2 and 3, the distribution of the farms on the basis of the net income per farm is shown below.

Net income on investment	Number of farms
$1 749 to 1 250	1
1 249 to 750	5
749 to 250	9
249 to -249*	30
-250 to -749	44
-750 to -1 249	17
-1 250 to -1 749	9
-1 750 to -2 249	6
-2 250 to -2 749	2
-2 750 to -3 249	2

*A minus sign indicates a net loss

A comparison of the 25 farms having the highest rate earned on the investment and of the 25 farms having the lowest rate earned is shown in the tables on the following pages. A summary showing the general locations of some of the differences in earnings between the two groups may be found on page 19.

Farms on the Lower Valued Land of North Central Illinois, 1931

Table 1--Investments, Receipts, and Expenses

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
Capital investments				
Land	$	$24 065	$21 620	$22 487
Farm improvements		4 759	4 422	5 116
Livestock--Total		3 218	3 122	3 649
Horses		532	447	452
Cattle		1 595	1 880	1 922
Hogs		826	554	1 042
Sheep		119	62	104
Bees		1	1	4
Poultry		145	178	125
Machinery and equipment		2 009	2 032	2 280
Feed, grain and supplies		1 948	1 671	2 048
Total capital investment	$	$35 999	$32 867	$35 580
Receipts and net increases				
Livestock--Total	$	$ 1 888	$ 2 545	$ 1 570
Horses		--	--	--
Cattle		265	439	279
Hogs		850	774	788
Sheep		29	39	13
Bees		--	--	--
Poultry		86	151	56
Egg sales		132	170	94
Dairy sales		526	972	340
Feed, grain and supplies		--	23	--
Labor off farm		83	120	69
Miscellaneous receipts		20	9	8
Total receipts and net increases	$	$1 991	$2 697	$1 647
Expenses and net decreases				
Farm improvements	$	$ 209	$ 192	$ 243
Horses		20	15	31
Miscellaneous livestock		--	--	1
Machinery and equipment		411	386	488
Feed, grain and supplies		201	--	636
Livestock expense		55	65	60
Crop expense		171	144	205
Hired labor		323	349	353
Taxes		340	318	357
Miscellaneous expense		61	51	78
Total expenses and net decreases	$	$1 791	$1 520	$2 452
Receipts less expenses	$	$ 200	$1 177	$ -805

Farm Earnings

There was an average net loss for investment, risk, and management of 1.47% of the total capital investment. The 25 most profitable farms had average net incomes of $443 a farm while the 25 least profitable farms had average net losses of $1524 a farm. There was a difference of $1967 a farm between the net incomes on the one-fifth most profitable and the net losses on the one-fifth least profitable of the farms. The net income from investment and management is the balance after deducting the value of the operator's and unpaid family labor, based on wages paid hired labor, from the receipts less expenses.

The figures given in the upper part of Table 3 help make clear that the receipts less expenses shown on the bottom line of Table 1 include changes in inventories as well as the cash balance for the year. The cash balance for the year is what the bank balance would show if all farm sales for the year had been deposited in one account and all farm expenses had been paid by checks on that account. The receipts less expense is the balance when the change in inventories is combined with the cash balance for the year.

The average cash balance a farm for the 125 farms was $1528 but decreases of $1328 a farm in inventories brought the receipts less expense down to $200. A more complete study of the inventory changes may be made from Table 2. About one-third of the inventory decrease was in feed, grain, and supplies and more than one-third in livestock.

Table 2--Changes in Farm Inventories

Items	Average of 125 farms		25 most profitable farms		25 least profitable farms	
	First of year	End of year	First of year	End of year	First of year	End of year
Land	$24 065	$24 065	$21 620	$21 620	$22 487	$22 487
Farm improvements	4 759	4 679	4 422	4 355	5 116	5 039
Total livestock	3 218	2 593	3 122	2 749	3 649	2 716
Machinery and equipment	2 009	1 888	2 032	1 885	2 280	2 194
Feed, grain and supplies	1 948	1 446	1 671	1 415	2 048	1 348
Total inventories	35 999	34 671	32 867	32 024	35 580	33 784

The family living furnished by the farm, when figured at the wholesale prices for which the products could have been sold, amounted to about $290 a farm or $61 a person in the farm family. This is not included in the receipts from the farm as shown in Table 1. This item may be considered as labor income for the farm operator and other members of the family in addition to the labor wages deducted in the accounts.

Farm Expenses

There was an average total expense of $10.04 per acre for the 125 farms. Of this amount, 88 cents was for net decrease in the horse and the feed, grain and supplies accounts. This leaves $9.16 an acre expense for the items usually included with operating expenses.

Farms on Lower Valued Land of North Central Illinois, 1931

Table 3--Farm Earnings

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
RATE EARNED ON INVESTMENT	%	-1.47 %	1.35 %	-4.28 %
Inventories--beginning of year	$	$35 999	$32 867	$35 580
Inventories--end of year		34 671	32 024	33 784
Change in inventories		-1 328	- 843	-1 796
Total cash sales during year		3 916	4 387	4 355
Total cash expenses during year		2 388	2 367	3 364
Cash balance for year		1 528	2 020	991
Receipts less expenses		200	1 177	-805
Total unpaid labor		730	734	719
Operator's labor		568	571	546
Family labor		162	163	173
Net income from investment and management		-530	443	-1 524
Return to capital and operator's labor and management		38	1 014	-978
5% of capital invested		1 800	1 644	1 779
Labor and management wage	$	$-1 762	$ -630	$-2 757
Net income per acre		-2.11	1.98	-5.40
Family living furnished by farm				
Farm products used in home	$	$ 290	$ 276	$ 268
Number in family		4.8	4.8	4.8
Farm produce used per person	$	$ 61	58	$ 56

Table 4--Farm Expenses

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
Total expense per acre of farm	$	$ 10.04	$ 10.05	$ 11.24
Selected items of expense		9.16	9.98	8.88
Farm improvements		.83	.85	.86
Machinery and equipment		1.64	1.72	1.73
Miscellaneous livestock expense		.22	.29	.21
Miscellaneous crop expense		.68	.64	.73
Hired and home labor		4.20	4.83	3.80
Taxes		1.35	1.42	1.27
Miscellaneous		.24	.23	.28
Livestock and grain decreases		.88	.07	2.36
Horses		.08	.07	.11
Miscellaneous livestock		--	--	--
Feed, grain and supplies		.80	--	2.25
EXPENSE PER $100 GROSS INCOME	$	$127	$84	$193

Size of Business

The standard of living of the farm family is largely dependent on the net income of the farm business over a period of several years. Even though a farm may be very efficiently operated, the total size or volume of business may be so small as to give an inadequate income. A fair to large size of business is therefore necessary if a good standard of living is to be provided for the farm family.

The total number of man work units per farm is probably as good a measure of size of business as can be applied to these records. A man work unit is a measure of the average amount of farm work done by a man in one 10-hour day. Ordinarily one man will take care of as many acres of crops and as much livestock as will require about 250 days at the average rate of work. The amounts of work done in a 10-hour day used in calculating the number of man work units of labor performed on these farms are based on detailed cost records kept during several years on about 20 Champaign and Piatt County farms. A more complete statement of standards used in this analysis is shown on page 16.

Man work units per farm	Number of farms
100 to 199	2
200 to 299	19
300 to 399	36
400 to 499	37
500 to 599	16
600 to 699	9
700 to 799	6

The care of the crops and livestock on one of the 125 farms in this study called for 160.9 man work units while another amounted to 773.3 man work units. The number of farms having varying amounts of work to do are shown on left.

Other measures of size of business are shown in Table 5. One reason for preferring man work units to other measures of size of business shown in Table 5 is that it takes into account the differences in kinds of crops grown and the differences in kinds and amounts of livestock.

Intensity of Business

A fairly large volume of business may be done on a small-sized farm by following an intensive type of farming such as dairying, poultry raising or truck farming. Where farms are uniform as to soil type and natural productiveness, the number of man work units required per acre of the farm is a good measure of intensity of business. A study of the records shows that the man work units per acre varied from .77 on one grain farm to 4.32 on a farm on which most of the income was from poultry, dairy products and hogs. The average of all the 125 farms produced crops and livestock requiring 1.71 man work units per acre. The farms varied as shown in the table on the left. Other measures that indicate intensity of farm business are shown in Table 6.

Man work units per acre	Number of farms
.70 to .89	1
.90 to 1.09	3
1.10 to 1.29	9
1.30 to 1.49	13
1.50 to 1.69	28
1.70 to 1.89	23
1.90 to 2.09	20
2.10 to 2.29	9
2.30 to 2.49	6
2.50 to 2.69	5
2.70 to 2.89	4
2.90 to 3.09	1
3.10 to 3.29	0
3.30 to 3.49	2
3.50 to more	1

Organization of Farm Business and Sources of Income

The general organization of the farm in regard to farm improvements, machinery and equipment and amount of livestock kept is indicated by the investments per acre. It may be noted in Table 7 that the 25 more profitable farms have less invested per acre in farm improvements, machinery and equipment and productive livestock than

Farms on Lower Valued Land of North Central Illinois, 1931

Table 5--Size of Business

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
TOTAL MAN WORK UNITS- - - - - - - -		428.3	450.1	420.9
Total investments - - - - - - - - - -	$	$35 999	$32 867	$35 580
Total receipts and net increases- -	$	1 991	2 697	1 647
Size of farm--total acres - - - - -		251.0	224.2	282.0
Acres of tillable land- - - - - - -		174.6	163.4	179.3
Acres in crops (crop acres) - - - -		163.5	153.8	171.1
Value of feed to productive livestock- - - - - - - - - - - - - - - - -	$	$ 1 838	$1 822	$2 121

Table 6--Intensity of Business

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
GROSS INCOME PER ACRE- - - - - - -	$	$ 7.93	$ 12.03	$ 5.84
Feed used per acre of farm - - - -		7.32	8.13	7.52
Pounds of pork produced per acre -		86.3	83.1	76.7
Man work units per acre- - - - - - -		1.71	2.01	1.49

Table 7--Organization of Farm Business and Sources of Income

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
Investments per acre--total- - - -	$	$ 143.40	$146.61	$126.17
Real estate- - - - - - - - - - - -		114.83	116.18	97.88
Land - - - - - - - - - - - - - -		95.87	96.45	79.74
Farm improvements- - - - - - -		18.96	19.73	18.14
Operating capital - - - - - - - - -	$	$ 28.57	$ 30.43	$ 28.29
Horses - - - - - - - - - - - - -		2.12	1.99	1.60
Productive livestock - - - - -		10.69	11.93	11.34
Machinery and equipment- - - -		8.00	9.06	8.09
Feed, grain and supplies - - -		7.76	7.45	7.26
Percent of income from				
Horses - - - - - - - - - - - - -		--	--	--
Cattle--beef or stock- - - - - -		13.3	16.3	16.9
Hogs - - - - - - - - - - - - - -		42.7	28.7	47.8
Sheep- - - - - - - - - - - - - -		1.5	1.5	.8
Poultry and eggs - - - - - - - -		10.9	11.9	9.1
Dairy products - - - - - - - - -		26.4	36.0	20.7
Feed, grain and supplies - - - -		--	--	--
Miscellaneous- - - - - - - - - -		5.2	4.7	4.7

do the less profitable farms.

The organization of the business is also shown by the source of income. It may be noted in Table 7 that the more profitable farms had less income from hogs and more from dairy products than did the less profitable farms.

Yield of Crops

Ordinarily crop yields have more to do with net farm incomes than any other factor except possibly livestock efficiency. In this regard the year 1931 proved the exception in this area. However, it will be noted in Table 8 that the yields of corn and oats were better on the more profitable farms. The heavy inventory decreases on many of the farms having high yields in 1930 largely offset the benefits of the good production in 1931. However, good yields secured by following practices that require low cash costs will continue to result in larger farm incomes.

Bu. per acre of corn	Number of farms
17.5 to 22.4	1
22.5 to 27.4	5
27.5 to 32.4	10
32.5 to 37.4	23
37.5 to 42.4	33
42.5 to 47.4	28
47.5 to 52.4	21
52.5 to 57.4	4

The yields of corn on these 125 farms, all of which are on good corn land, varied from 19.4 bushels to 56.0 bushels per acre. The numbers of farms with different yields are shown to the left.

Organization of the Cropping System

The percent of tillable land in the higher profit crops as contrasted with the amount in the low profit crops has proved a fair measure of the profitableness of the cropping system. As shown in Table 8, corn, winter wheat, canning and truck crops, alfalfa, and sweet clover on tillable land were classified as high profit crops in Livingston, McLean, Tazewell and Woodford counties. Oats, timothy and bluegrass were classified as low profit crops. All other crops were included as of medium profit. In the other counties, which are further north and have more livestock, winter wheat and oats were classified as medium profit crops. Giving half as much credit for the medium profit crops as for the high profit crops, it is found that the percent of the tillable land in the higher profit crops varies as shown to the left.

Percent of tillable land in higher profit crops	2/ Number of farms 3/
45.0 to 49.9	2
50.0 to 54.9	3
55.0 to 59.9	3
60.0 to 64.9	2
65.0 to 69.9	5
70.0 to 74.9	8
75.0 to 79.9	2
80.0 to 84.9	12
85.0 to 89.9	0

It may well be noted in Table 8 that 21.4% of the tillable land on the more profitable farms was occupied by some legume during the year 1931 or had first-year sweet clover plowed under for the 1931 crop of corn, while only 18.3% of the tillable land on the less profitable farms was so treated.

2/ and 3/--See notes at bottom of page 9.

Farms on Lower Valued Land of North Central Illinois, 1931

Table 8--Yield of Crops and Cropping System

Crops grown	Profitableness of crop 1/ 2/	Profitableness of crop 1/ 3/	Yield per acre: Your farm	Yield per acre: Aver. of 125 farms	Yield per acre: 25 most profitable farms	Yield per acre: 25 least profitable farms	Percent of tillable land in crops: Your farm	Percent of tillable land in crops: Aver. of 125 farms	Percent of tillable land in crops: 25 most profitable farms	Percent of tillable land in crops: 25 least profitable farms
Grain										
Corn	H	H		41.2	42.6	38.8		46.4	48.8	47.8
Oats	M	L		39.6	42.0	38.7		18.9	15.2	18.1
Winter wheat	M	H		25.1	27.8	27.4		7.3	5.0	6.6
Spring wheat	M	M		17.8	20,2	8.3		1.4	3.3	1.0
Barley	M	M		29.2	27,9	25.9		4.1	4.3	3.9
Soybeans	M	M		18.1	18.9	9.7		1.3	.7	1.9
Miscellaneous								1.0	.5	2.9
Hay										
Timothy	L	L		1.1	.9	1.0		1.2	1.3	.8
Clover	M	M		1.1	1.3	.9		2.0	1.8	.3
Alfalfa	H	H		2.8	2.7	2.5		3.4	4,1	2.7
Clover & timothy	M	M		1.0	1.0	1.5		.8	.5	.4
Soybeans	M	M		1.6	1.8	1.6		2.5	3.7	3.0
Miscellaneous								,4	.1	.2
Miscellaneous crops								2.9	4.8	5.8
Pasture										
Bluegrass	L	L						1.3	1.2	.5
Timothy	L	L						.9	,3	.6
Clover	M	M						.3	,9	.0
Sweet clover	H	H						1,5	1,6	.7
Clover & timothy	M	M						.2	.3	.3
Sweet clover mixed	H	H						1,0	.3	1.3
Alfalfa	H	H						,7	1,0	.3
Miscellaneous								.5	,3	.9
Percent of tillable land in--2/										
All high profit crops								54,2	59.3	53.6
All medium profit crops								42,0	37.9	44.5
All low profit crops								3.8	2.8	1.9
ALL HIGH PLUS ONE-HALF MEDIUM PROFIT CROPS								75.2	78,2	75.8
Percent of tillable land in--3/										
All high profit crops								61.5	64,3	60.2
All medium profit crops								15.6	17.5	19.5
All low profit crops								22.9	18.2	20.3
ALL HIGH PLUS ONE-HALF MEDIUM PROFIT CROPS								69.3	73.0	70.0
Percent of tillable land in--										
Legumes left down for year								14.9	17.5	12.7
Crop following first year sweet clover plowed under								4.5	3.9	5.6

1/ H refers to high profit; M, to medium, and L to low profit crops.

2/ Crops rated as high, medium or low profit crops on farms in Henry, Knox, Peoria, Stark, Grundy, LaSalle, Marshall, and Putnam counties.

3/ Crops rated as high, medium or low profit crops on farms in Livingston, McLean, Tazewell and Woodford counties.

Amounts of Productive Livestock

The value of feed fed per acre to productive livestock gives an idea of the relative amounts of livestock kept on different farms, as those amounts affect the net farm incomes. The total amount of feed fed to, and the total returns from, productive livestock indicate the total size of the livestock enterprise. In the analysis in Table 9 the total returns from each class of livestock include the products used on the farm as well as those sold. The feed used on these 125 farms varied from 27 cents an acre on one farm to $33.69 an acre on another. The numbers of farms using different amounts of feed follow.

Feed per acre	Number of farms
$ .00 to $1.99	1
2.00 to 3.99	24
4.00 to 5.99	32
6.00 to 7.99	16
8.00 to 9.99	23
10.00 to 11.99	14
12.00 to 13.99	2
14.00 to 15.99	4
16.00 to 17.99	4
18.00 to 19.99	0
20.00 to 21.99	1
22.00 to 23.99	1
24.00 or more	3

Unless it was unusually well handled, a large amount of livestock had little advantage on these farms as far as net income on the investment was concerned in 1931. It may be noted in Table 9 that there was $7.52 worth of feed per acre used on the less profitable group of farms and $8.13 worth used on the more profitable farms.

Efficiency of Productive Livestock

Efficiency of livestock production as measured by the returns for each $100 of feed fed apparently had more effect than any other one factor on net farm incomes in this area in 1931. Two farms had less than $50 returns for each $100 worth of feed fed, while others each gave $200 or more total return for each $100 of feed used. The 125 farms ranged as follows in this factor.

Returns per $100 feed to livestock	Number of farms
$ 30 to $ 49	2
50 to 69	6
70 to 89	23
90 to 109	16
110 to 129	26
130 to 149	22
150 to 169	17
170 to 189	10
190 to 209	1
210 to 229	0
230 to 249	0
250 to 269	1
270 to 289	0
290 to 309	1

Table 10 shows that there was an average return of $151 for $100 worth of feed fed to all productive livestock on the more profitable farms and only $84 return for $100 feed on the less profitable group. This same relation is seen in the case of each kind of livestock.

It may well be noted that there was an average of 107.7 eggs produced per hen on the more profitable farms and only 92.8 eggs per hen on the less profitable group. There were 6.4 pigs weaned per litter and 100 pounds of pork produced with only 381 pounds of feed on the more profitable farms, while only 5.4 pigs were weaned per litter and 475 pounds of feed were used for each 100 pounds gain on the less profitable farms. The milk production was 1693 pounds more per cow on the more profitable farms and the total dairy returns amounted to $29 more per cow.

Farms on Lower Valued Land of North Central Illinois, 1931

Table 9--Amount and Efficiency of Productive Livestock*

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
Total feed to all productive livestock	$	$1 838	$1 822	$2 121
Beef cattle		1 159 (43)	1 332 (5)	1 578 (13)
Mixed cattle		689 (60)	1 077 (10)	426 (9)
Dairy cattle		702 (22)	804 (10)	469 (3)
Hogs		840 (123)	634	931
Sheep		135 (46)	100 (9)	147 (9)
Poultry		104	133	83
TOTAL FEED USED PER ACRE	$	$ 7.32	$ 8.13	$ 7.52
Total returns from productive livestock	$	$2 118	$2 756	$1 772
Beef cattle		914 (43)	1 647 (5)	1 077 (13)
Mixed cattle		859 (60)	1 731 (10)	271 (9)
Dairy cattle		1 082 (22)	1 250 (10)	599 (3)
Hogs		908 (123)	811	822
Sheep		83 (46)	113 (9)	43 (9)
Poultry		277	382	206
Total returns per acre		8.44	12.29	6.28

Table 10--Efficiency of Productive Livestock

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
Returns per $100 feed fed to				
All productive livestock	$	$ 115	$ 151	$ 84
Beef cattle		79	124	68
Mixed cattle		125	161	64
Dairy cattle		154	155	128
Hogs		108	128	88
Sheep		61	113	29
Poultry				
Returns per $100 invested	$	$ 207	$ 239	$ 175
Number of hens--average for year		110.7	125.8	109.9
Number of eggs per hen--average		106.5	107.7	92.8
Hogs				
Pounds of pork produced		21 657	18 638	21 631
Returns per 100 lbs. pork	$	$ 4.13	$ 4.35	$ 3.80
Feed cost per 100 lbs. pork		3.82	3.40	4.30
Pounds of feed per 100 lbs. pork		443	381	475
Pigs weaned per litter		5.7	6.4	5.4
Dairy cows				
Number of cows milked		7.5	10.7	6.2
Pounds of milk per milk cow		6 647	7 385	5 692
Dairy returns per milk cow	$	$ 86	$ 101	$ 72

*A figure in parenthesis designates the number of farms which that item represents.

Labor and Power and Machinery Efficiency

On one farm the work in caring for the crops and livestock should have required only 142.7 days for each man working on the farm, while on another farm the acres of crops and amounts of livestock cared for would normally require 400.5 days of labor per man. Page 16 gives a discussion of the standards by which the man work units are calculated. This great difference in the amount of work accomplished per worker on different farms is shown on the left side below.

Man work units per man	Number of farms	Horse and machinery efficiency index[1]	Number of farms
140 to 169	4	40 to 59	3
170 to 199	19	60 to 79	19
200 to 229	28	80 to 99	29
230 to 259	31	100 to 119	33
260 to 289	20	120 to 139	24
290 to 319	12	140 to 159	7
320 to 349	7	160 to 179	4
350 to 379	1	180 to 199	2
380 to 409	3	200 or more	3

[1] Includes mechanical power

Above on the right side is shown the distribution of farms according to the Horse and Machinery Efficiency Index. The horse and machinery efficiency index for any farm is calculated by finding the number of acres of crops worked on that farm with the same horse and tractor power and machinery cost with which 100 acres of crops are worked on the average farms of the same size and having the same amounts of livestock feeding to do. This enables each cooperator to compare his horse and machinery efficiency with that of other farms of the same size as his and with those having like amounts of work with livestock.

The table on page 17 will enable each cooperator to determine whether a high or low cost for horse power and machinery is caused by high or low costs of operating his truck, auto, tractor, other machinery or horses.

Amounts and Prices of Some Products Sold

Differences in prices received for products sold had more to do with placing farms in the high or low groups than has usually been true other years. On some farms products on hand were sold before large price declines had taken place, and some farms were favored by special markets for at least part of their products. The range in average prices of all six products listed in Table 12 is shown on the left.

Percent of average price received	Number of farms
70.0 to 79.9%	6
80.0 to 89.9%	29
90.0 to 99.9%	38
100.0 to 109.9%	30
110.0 to 119.9%	13
120.0 to 129.9%	4
130.0 to 139.9%	1
140.0 to 149.9%	2
150.0 or more	2

Farms on Lower Valued Land of North Central Illinois, 1931

Table 11--Labor and Power and Machinery Costs

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
Labor				
MAN WORK UNITS PER MAN- - - - - - -		242.0	248.7	236.5
Average number of men - - - - - - -		1.77	1.81	1.78
Labor cost per crop acre- - - - - -	$	$ 6.21	$ 6.68	$ 6.06
Power and machinery				
HORSE AND MACHINERY EFFICIENCY INDEX- - - - - - - - - - - - - - - -		100.0	110.3	89.6
Percent of farms with tractors- - -		75.2	72.0	72.0
Percent of farms with trucks- - - -		40.8	48.0	40.0
Average number of workable horses -		5.43	5.06	4.92
Value of feed fed to horses - - - -	$	$ 218	$ 195	$ 206
Feed cost per workable horse- - - -		40	39	42
Costs per crop acre				
Horse feed and depreciation - - -	$	$ 1.46	$ 1.37	$ 1.39
Machinery- - - - - - - - - - - - -		2.51	2.51	2.85
Horses and machinery - - - - - - -		3.97	3.88	4.24
Labor, horses and machinery - - -		10.18	10.56	10.30

Table 12--Amounts and Prices of Some Products Sold

Items	Your farm	Average of 125 farms	25 most profitable farms	25 least profitable farms
Amounts sold				
Corn--bushels - - - - - - - - - - - -		790	801	842
Oats--bushels - - - - - - - - - - - -		376	350	393
Wheat--bushels- - - - - - - - - - - -		209	181	143
Pork--pounds- - - - - - - - - - - - -		20 959	16 664	21 874
Milk--pounds- - - - - - - - - - - - -		51 182	75 329	31 878
Eggs--dozens- - - - - - - - - - - - -		685	828	439
Prices received				
Corn--cents per bushel- - - - - - -	$	$ .47	$ .48	$ .45
Oats--cents per bushel- - - - - - -		.23	.25	.21
Wheat--cents per bushel - - - - - -		.48	.47	.52
Pork--dollars per 100 lbs.- - - - -		5.97	5.87	6.11
Milk--dollars per 100 lbs.- - - - -		1.32	1.42	1.32
Eggs--cents per dozen - - - - - - -		.20	.21	.18
PERCENT OF AVERAGE PRICE RECEIVED FOR ALL- - - - - - - - - - - - - - - -	%	100.0 %	103.4 %	100.0 %

Explanation of the Farm Efficiency Chart

(See Chart on page 15)

The figure in any column just above the double line across the middle of the chart is for the middle farm of all the farms to which that factor applies; that is, there are as many farms above that figure as there are below it.

The figure in any column just above the top single line across the chart represents approximately the most efficient farm in the factor named at the top of that column. The figure at the bottom of each column of the chart represents approximately the least efficient farm in that factor.

The figure in any column just above the second from the bottom line across the chart represents approximately the most efficient of the one-fifth of the farms which are lowest in that factor. It also represents approximately the least efficient in the next to the lowest one-fifth of the farms in that factor.

Likewise, the figure in any column just above the next to the top line across the chart represents approximately the least efficient of the one-fifth best farms in that factor. It also represents approximately the most efficient of the second to the best one-fifth group of the farms in that factor. The other lines separate the middle group in each factor from the groups next to it.

By drawing a line across each column at approximately the place which represents the efficiency of his farm in each factor and then, by filling in with a colored crayon or pencil the space below such lines, a cooperator can see clearly where his farm stands in efficiency in each factor.

Table 13--Relation of Net Income from Investment to Number of Factors in Which Farms Excel

Number of factors in which farms excel	Number of farms	Rate earned	Net income from investment
8 or more	16	+.58	$ 140
7	22	-.12	-146
6	17	-.73	-256
5	20	-1.73	-672
4	17	-2.42	-758
3	12	-2.13	-806
2 or less	21	-3.36	-1 186

The following 10 factors were used in the analysis shown in the table above: expense per $100 gross income, gross receipts per acre, man work units per farm, yield of corn, percent of land in higher profit crops, feed fed per acre to productive livestock, returns per $100 feed to all productive livestock, man work units per man, horse and machinery efficiency index, and percent of average price received. Only one farm was above the average in all 10 factors. Sixteen that were above the average in eight or more factors averaged a net income of $140 a farm. Twenty-one others that were above the average in only two or less factors had an average net loss of $1186 a farm. The two groups had an average difference of $1326 a farm in net earning power.

The value of well balanced farming in which all parts of the business are done at least fairly well is clearly shown in this table.

Farm Efficiency Chart

(See page 14 for an explanation of the use of this chart)

Rate earned on investment	Expense per $100 gross income	Gross receipts per acre	Man work units per farm	Bushels per acre: Corn	Bushels per acre: Oats	Bushels per acre:	Percent land in higher profit crops	Feed per acre to productive livestock	Returns per $100 feed to productive livestock: cattle	Returns per $100 feed to productive livestock: Hogs	Returns per $100 feed to productive livestock: Sheep	Returns per $100 feed to productive livestock: Poultry*	Returns per $100 feed to productive livestock: All productive livestock	Man work units per man	Horse and machinery efficiency	Percent of average prices received
5.8	52	35	760	56	70			30		190	250	400	200	400	210	155
The best one-fifth of the farms in each factor come between this line and the next line below.																
.1	99	13	533	47	50			10		139	150	265	155	287	130	109
The second best one-fifth of the farms in each factor come between this line and the next line below.																
-.9	115	10	437	43	42			9		115	72	202	131	251	110	100
-1.3	124	8	411	41	40			7		107	66	168	123	241	104	97
-1.8	133	7	380	40	37			6		98	57	166	112	229	98	94
The second lowest one-fifth of the farms in each factor come between this line and the next line below.																
-3.0	164	6	310	35	31			4		80	1	120	84	203	82	88
The lowest one-fifth of the farms in each factor come between this line and the bottom line.																
-6.0	300	3	180	20	18			1		20	-100	-30	40	142	50	75

*Returns for $100 invested used for poultry.

Analysis of Horse Power, Mechanical Power, and Machinery Costs

Horse power, mechanical power and machinery costs on corn-belt farms make up a larger part of all farm operating costs than any other single item except labor. It has been difficult for many who have cooperated in the Farm Management Service to see wherein their horse and machinery costs were particularly high or low. In order to analyze these costs more completely the farms on the higher valued lands have been grouped according to the size of farm and use of tractor and truck in Table 15. The data include those from 521 farms in the Farm Management Service on the higher valued lands in the counties included in this report. It was thought better to use these data from the higher valued lands as standards than to use averages of the small number of farms on the lower valued lands.

By comparing the records of his farm with the average of other farms of the same size and having the same type of power and equipment as his, each cooperator may locate rather definitely the places that his horse and machinery costs are particularly high or low. The information in this table is presented only for the purpose indicated. Data for only one year on so small a number of farms as appear in some of the groups are not considered sufficient from which to draw conclusions regarding the relative profitableness of farming with or without tractors or trucks, or on different sizes of farms.

Man Work Units Per Man, A Measure of Labor Efficiency

The measure of labor efficiency used in this report is the average number of man work units worked per man during a full year of 12 months. A man work unit is a measure of the average amount of work done in one 10-hour day. The amounts of work done in a 10-hour day used in calculating the number of man work units of labor performed on these farms are based on detailed cost records kept during the four years of 1926, 1927, 1928, and 1929 on about 20 farms in Champaign and Piatt counties and on dairy enterprise studies in north central Illinois for 1928 and 1929.

Table 14--Standards for Calculating Man Work Units

Crops			Livestock		
Kind of crop	Man hours per acre	Man work units per acre	Kind of livestock	Man hours per animal unit	Man work units per animal unit
Corn	13.3	1.33	Cattle other than cows milked	22.0	2.2
Oats	6.5	.65	Cows milked by hand	124.2	12.4
Wheat (winter)	10.2	1.02	Cows milked with machine	94.6	9.5
Wheat (spring)	7.7	.77	Hogs (per 100 pounds produced)	2.7	.27
Rye	10.2	1.02			
Barley	7.1	.71			
Soybeans	10.9	1.09			
Alfalfa	13.1	1.31	Sheep	31.6	3.16
Clover	7.6	.76	Poultry	207.5	20.75
Timothy	6.4	.64	Horses	48.9	4.89
Soybean hay	15.9	1.59			
Sweet corn[1]	13.3	1.33			
Canning peas[1]	12.0	1.20			
Truck crops[1]	100.0	10.0			

[1] Estimates

Table 15--Analysis of Horse Power, Mechanical Power, and Machinery Costs

Items	Your Farm	Farms under 180 acres			Farms of 180 to 299 acres			Farms of 300 acres or more		
		With tractor and truck	With tractor without truck	Without tractor or truck	With tractor and truck	With tractor without truck	Without tractor or truck	With tractor and truck	With tractor without truck	Without tractor or truck
Number of farms		53	75	38	105	112	20	60	55	3
Investments										
Truck	$	$ 256	$ ---	$ ---	$ 255	$ ---	$ ---	$ 315	$ ---	$ ---
Auto		185	171	152	197	243	133	190	168	230
Tractor		458	459	---	564	587	---	853	688	---
Other machinery		1312	1052	812	1616	1330	942	2286	1706	1185
All machinery		2211	1682	964	2632	2160	1075	3644	2562	1415
Horses		369	407	562	571	546	663	772	791	1115
Horses and machinery		2580	2089	1526	3203	2706	1738	4416	3353	2530
Expenses and net decreases										
Truck	$	$ 90	$ ---	$ ---	$ 80	$ ---	$ ---	$ 108	$ ---	$ ---
Auto		77	76	81	93	105	91	94	83	104
Tractor		116	140	---	189	182	---	281	259	---
Other machinery		161	132	104	203	189	147	295	256	199
Total machinery cost		444	348	185	565	476	238	778	598	303
Horse feed and depreciation		184	185	268	235	255	308	329	338	406
Machinery and horse cost		628	533	453	800	731	546	1107	936	709
Labor cost		859	787	721	1094	1078	976	1514	1467	1347
Labor, machinery & horse cost		1487	1320	1174	1894	1809	1522	2621	2403	2056
Expenses per acre of crops										
Machinery	$	$ 3.73	$ 2.99	$ 1.83	$ 2.94	$ 2.56	$ 1.46	2.46	$ 2.03	$ 1.11
Horse feed and depreciation		1.55	1.59	2.65	1.22	1.37	1.88	1.04	1.15	1.49
Machinery and horses		5.28	4.58	4.48	4.16	3.93	3.34	3.50	3.18	2.60
Labor		7.22	6.75	7.14	5.69	5.79	5.96	4.78	4.98	4.96
Labor, machinery & horses		12.50	11.33	11.62	9.85	9.72	9.30	8.28	8.16	7.56
Total acres in farm		146.7	144.2	132.6	236.3	227.9	209.2	400.9	372.2	313.3
Acres in crops		118.9	116.5	101.0	192.3	186.1	163.7	316.6	294.5	271.8
Feed per acre to livestock	$	$ 9.57	$ 9.43	$ 4.43	$ 7.17	$ 7.36	$ 5.40	7.05	$ 6.79	$ 8.28

In Table 14, page 16 is given the standard number of hours of man labor required throughout the year to care for one acre of each crop or for an animal unit of each kind of livestock. In this study, one animal unit consists of one mature horse or cow, 2 colts or calves or yearling cattle in the breeding herd, 2 feeder cattle, 5 mature sheep, 10 to 15 lambs or feeder sheep and 100 hens. The number of each class of livestock was calculated for each farm by taking the average of the numbers on hand at the beginning and at the end of the year.

Value of Farm Products Used in the Farm Home

The amounts of farm products used in the homes of the cooperators have been estimated and recorded from month to month. The average total value of such products at the farm selling prices amounted to $290 per farm for the 125 farms on which such records were kept, as shown in the table on this page.

The prices used were approximate wholesale farm prices as follows: milk, 10 cents per gallon, or about $1.15 per 100 pounds; cream, 11 cents per pint; butter, 30 cents per pound; eggs, 18 cents per dozen; poultry and other meats, live weight farm price at the time slaughtered; and potatoes 50 cents per bushel. The value of other vegetables was estimated according to the size and quality of the garden and the number of persons in the family during the garden season. This estimate was based on studies made in former years by the Department of Farm Organization and Management in connection with detailed cost account investigations. Fifteen cents per quart was used in case of all vegetables and fruits produced on the farm and canned or preserved for winter use.

The value of these farm products used in the home was not included in the farm receipts as shown in Table 1, page 3. However, the values of the poultry and livestock products were included in the returns from each class of livestock in figuring the livestock efficiency factors as shown in Table 9, page 11.

Table 16--Amounts and Value of Farm Products Used in the Farm Home
Average 315 Farms, 1931

Product	Amounts	Wholesale farm price	Wholesale farm value
Fuel	--	--	$ 6
Milk	330 gal.	$.10	33
Cream	191 pts.	.11	21
Butter	90 lbs.	.30	27
Eggs	194 doz.	.18	35
Poultry	--	--	24
Beef	--	--	8
Pork	704 lbs.	.063	44
Mutton	--	--	1
Potatoes	16 bu.	.50	8
Other vegetables	--	--	40
Fresh fruits	--	--	4
Canned fruits and vegetables	240 qts.	.15	36
Miscellaneous	--	--	3
Total			$290

Location of Differences in Incomes Between the More Profitable and the Less Profitable Farms

Much of the difference in the average net earnings between the 25 most profitable and the 25 least profitable farms is accounted for in Table 17.

Quality of land. The 125 farms used in this report are all on the lower valued lands of these 4 counties. It is shown in Tables 5 and 7, page 7, that the more profitable farms had a larger proportion of tillable land and land of a higher appraised value than the less profitable farms.

Inventory changes. There was more decrease of inventories on the less profitable than on the more profitable farms. This is discussed on page 4. Inventory changes affecting factors other than feed and grain enter into the data shown in Table 17.

Efficiency of livestock. The 25 more profitable farms realized $151 from each $100 worth of feed fed to productive livestock while the 25 least profitable farms received only $84 or a difference of $67 for each $100 worth of feed used. The average amount of feed used on all farms was valued at $1838 at farm prices. The larger returns for each $100 of this feed used on the more profitable farms accounts for $1231 difference in average gross income between the two groups of farms. This does not include the cost of keeping horses on the two groups of farms. The better returns for feed fed on the

Table 17--Location of Differences in Incomes Between the 26 Most Profitable and the 26 Least Profitable Farms

Factors considered	Average difference
Efficiency of livestock	$1 231
Crop yields	236
Prices of grain	28
Cropping system	25
Amount of livestock	23
Miscellaneous expense	- 20
Cost of power and machinery	- 23
Cost of man labor	-228
Total located differences	$1 272
Difference in net incomes--5.63% of average capital	$2 027

more profitable farms were partly due to the kind of livestock kept. As an average, there were 4.5 more milk cows and 15.9 more hens per farm on the more profitable farms. About 60% of the grain produced on these farms was fed, the rest being sold as grain. In areas where more grain is fed on the farms, livestock efficiency becomes relatively more important.

Crop yields. Most years differences in yields of crops account for much of the differences between the more and less profitable groups of farms. However, in 1931, the larger inventory losses more frequently occurred on farms having high production in 1930, and this tended to offset the advantages of good yields in 1931. Consequently it is seen in Table 8, page 9, and in Table 17, page 19, that there was an advantage of only $236 because of better yields on the more profitable farms in 1931.

Prices of grain. Not much of the differences in income between the two groups of farms can be attributed to differences in prices of grain. It is shown in Table 12, page 13, that the more profitable farms received as an average 3 cents a bushel more for corn, 4 cents more for oats, and 5 cents less for wheat than the less profitable farms. These differences, applied to the amounts sold on the average of all farms, show a total difference of only $28 in favor of the more profitable farms.

As shown in Table 17, not much of the average difference between the two groups of farms can be attributed to any other one factor. The heavy inventory losses on farms that had good production in 1930, or that carried their 1931 crops and livestock over the first of the year tended to counteract the influence that several of the factors usually show on net earnings.

While the expenses an acre were greater on the more profitable farms, it may well be noted that they had less untillable pasture land and more livestock an acre that required increased labor and equipment. It is significant that with only $271 more expense for labor, power and machinery and miscellaneous items of expense, the more profitable farms produced crops and livestock worth $1523 more.

Comparison of Seven Years' Records

Earnings for a seven-year period on a group of farms in Livingston, McLean, Tazewell and Woodford counties are shown in Table 18. The figures in the first column are averages for the three years of 1925, 1926, and 1927. The 315 records for 1931 do not include about 40 farms on lower-valued land that were included in the reports of earlier years.

The extent to which the general depression has affected corn-belt agriculture is indicated by the drop in farm receipts less expenses from $4282 a farm in 1928 to $201 a farm in 1931. While there was a drop during those four years of $18.65 an acre in gross receipts, there was a decrease of only $2.10 an acre in total expense.

Increased efficiency during the period is shown by the increase in percent of tillable land in higher profit crops, in the larger number of eggs produced per hen and the increase in pounds of milk produced per cow.

Organization and Purpose of the Farm Bureau-Farm Management Service

The Farm Bureau-Farm Management Service was first organized in Illinois during the latter part of 1924. The cooperators in the original project were farm bureau members of Livingston, McLean, Tazewell and Woodford counties. Its purpose is to assist the cooperating farmers to keep such farm accounts as will enable them to study the efficiency with which they are conducting their farm business and to apply to their individual farms the practices in farm organization and operation which have proved profitable on other farms of a similar type. The project is an outgrowth of the regular farm management extension work in farm accounting begun in 1915.

Table 18--Comparison of Seven Years' Records
Farms in Farm-Bureau Farm Management Service in
Livingston, McLean, Tazewell and Woodford Counties

Items	Average 1925-6-7	1928	1929	1930	1931*
Number of farms*	175	150	380	380	315
Rate earned on investment	3.34%	5.66%	5.56%	.97%	-.92%
Labor and management wage	$-296	$1084	$1003	$-1616	$-2964
Receipts less expenses	2958	4282	4023	1463	201
Cash balance for year	3297	3336	3315	2884	1735
Change in inventories	-339	+946	+708	-1421	-1534
Gross receipts per acre	22.36	27.86	27.17	15.43	9.21
Total expense per acre	13.68	13.60	13.49	13.01	11.50
Net receipts per acre	8.68	14.26	13.68	2.42	-2.29
Size of farm in acres	232.3	234.6	227.6	230.6	240.3
Value of land per acre	$195.12	$189.47	$184.20	$184.64	$190.60
Farm improvements per acre	24.41	24.88	24.60	24.35	24.95
Machinery investments per acre	8.19	8.53	8.24	9.17	9.42
Total investment per acre	259.99	251.74	246.12	248.21	248.55
Receipts and net increases--total	$5194	$6535	$6185	$3559	$2212
Feed, grain and supplies	2211	3322	2936	969	535
Cattle	560	670	599	341	180
Dairy products	347	469	611	583	424
Hogs	1654	1566	1579	1335	792
Sheep	71	110	68	24	26
Poultry and eggs	266	305	312	218	180
All other income	85	93	80	89	75
Bushels per acre of					
Corn	49.7	53.0	46.2	36.1	48.4
Oats	37.4	43.8	45.8	35.8	49.1
Winter wheat	19.7	18.4	21.1	24.9	26.2
Barley	----	29.7	28.3	23.6	34.5
Percent of tillable land in					
High profit crops	59.9	60.8	61.4	61.9	64.2
Medium profit crops	8.7	15.1	13.9	13.4	13.0
Low profit crops	31.4	24.1	24.7	24.7	22.8
Feed per acre to productive livestock	$ 9.04	$ 10.34	$ 10.60	$ 9.74	$ 6.45
Returns per $100 feed to					
All productive livestock	$151	$ 142	$ 144	$ 126	$ 118
Beef cattle	99	133	120	92	80
Hogs	163	127	134	128	109
Pounds of pork per acre	73.1	76.0	73.7	72.0	84.5
Pounds of milk per milk cow	---	---	6166	6574	6839
Eggs per hen	84.9	92.5	94.0	93.5	102.0
Hired and home labor per crop acre	$ 8.36	$ 8.27	$ 8.14	$ 7.29	$ 5.67
Man work units per man	---	---	---	232.1	238.6
Horse and machinery per crop acre	5.65	5.54	5.35	5.07	3.83

*Records of 37 farms on the lower valued land of the area were not included in this summary in 1931. Such farms are included among the farms for other years.

The Service was organized in Henry, Knox, Peoria and Stark counties during the fall of 1929 and in Grundy, LaSalle, Marshall and Putnam counties during the fall of 1930. More farm accounting had been done in these areas of Illinois during previous years than in most parts of the state. Farm management tours have played an important part in developing interest in the work. The growing number of farmers keeping records has made it impossible for the College of Agriculture to give through the regular extension work the assistance desired by the farmers. This situation led to the organization of the Farm Bureau-Farm Management Service.

While the financial accounts kept in this service are similar to those used in the extension project in farm accounting, the additional records regarding croping systems, crop and livestock production and feeds fed to each class of livestock and the personal contact with and assistance from the fieldman make the work of much more value to individuals. Additional records of practices followed in the production of each kind of crop and livestock and in the use of labor and power and machinery also make the Farm Bureau-Farm Management Service of more value to the cooperators than is the extension project in farm accounting.

The total average annual cost of this service is about $35 per farm. The fees vary with the size of the farm, there being an increase of $1.50 per year for each 40 acres above 60 acres. Eight of the eleven farm bureaus have paid $5 per farm per year. They do this because of the value of the general information to all farm bureau members. It is true, however, that all individual records are kept confidential. The Department of Farm Organization and Management of the University of Illinois, through salaries of those directing the work, clerical help, materials, printing, and other expenses incident to the work spends about $10 per farm per year on the project.

Advisory committees, composed of one representative from each farm bureau and the head of the Department of Farm Organization and Management plan and direct the work in the three areas where the work is organized. These committees employ the fieldmen from among those recommended by the University. The funds collected from the cooperators by the farm bureaus are held and expended by the advisory committees.

The fieldmen make four or five regular trips to all the farms during the year and meet the cooperators another time in the farm bureau office or other convenient place during January to check over the account books for the preceding year. On these visits they assist the men with their records and secure information about practices with crops and livestock. During the second and succeeding years they spend considerable time in studying the annual report with each cooperator and give extra time to those who wish special service in the way of reorganizing some parts of the farm business.

The Farm Bureau-Farm Management service throughout the state is under the direct superivision of Mr. M. L. Mosher, assistant professor of Farm Organization and Management. He assists the local farm bureaus in organizing the groups of cooperators and helps the fieldmen in planning and carrying out their work. He also supervises summarizing the farm account books, analyzing the data and preparing the annual reports.

As head of the Department of Farm Organization and Management, Professor H. C. M. Case gives general supervision to all of the work of the project. He meets with the advisory committees and assists in the preparation of the annual reports and in planning different phases of the work.

The organization of the project in this area was made possible by the hearty support and assistance of the farm advisers and their assistants in the four counties.

The fieldmen, farm advisers and committeemen during the past year were as follows:

County	Fieldman	Adviser	Committeeman
Livingston	W. A. Herrington	S. G. Turner	G. F. Bennett
Woodford	" "	H. A. de Werf	J. Frank Felter
McLean	J. B. Andrews	R. J. Laible	B. C. Kraft
Tazewell	" "	R. E. Arnett	W. C. Sommer
Henry	F. A. Fisher	H. K. Danforth	J. P. Hanna
Knox	" "	A. R. Kemp	Ira Moats
Peoria	" "	J. W. Whisenand	Chas. W. Holmes
Stark	" "	W. A. Gilbert	J. A. Briggs
Grundy	J. B. Cunningham	R. V. Watson	Ed. N. Burnham
LaSalle	"	C. E. Gates	R. E. Peddicord
Marshall-Putnam	"	L. J. Hagar	R. V. McKee

Farm Practices That Pay

Much of the data regarding crops and livestock practices collected by the fieldmen in this type of service in the other counties of north central Illinois during the years of 1925 to 1930 inclusive have been analyzed. They appear with other data based on 18 years work of the Department of Farm Organization and Management in Circular 389 of the Agricultural Experiment Station entitled, "Farm Practices That Pay." This circular may be had free by addressing a request for it to the Agricultural Experiment Station, University of Illinois, Urbana, Illinois.

It is suggested that each cooperator secure a copy of this circular and study it carefully. It will help to answer the questions about how the men who get best results along different lines do their work.

Printed in furtherance of the Agricultural Extension Act
approved by Congress May 8, 1914, H. W. Mumford,
Director Extension Service,
University of Illinois

FOM78-400-5-32

EIGHTH ANNUAL REPORT OF THE FARM BUREAU-FARM MANAGEMENT SERVICE FOR THE FARMS OF 430 COOPERATORS ON THE HIGHER VALUED LAND IN NORTH CENTRAL ILLINOIS FOR THE YEAR 1932*

J. B. Andrews, J. B. Cunningham, F. A. Fisher, M. L. Mosher, H. C. M. Case

The net losses for the area as a whole were slightly less in 1932 than in 1931. In Henry, Knox, Peoria, and Stark Counties the net losses averaged 94 cents per acre in 1932, but were $3.66 an acre in 1931. In Livingston, McLean, Tazewell, and Woodford Counties, the losses were higher in 1932, being $2.99 per acre as compared with $2.29 in 1931. The losses were also slightly higher in 1932 in Grundy, LaSalle, Marshall, and Putnam Counties, being $1.92 an acre as compared with $1.66 in 1931.

The fact that there are more beef cattle and hogs in Henry, Knox, Peoria, and Stark Counties than in the other areas and that meat production was relatively more profitable than grain production in 1932 than in 1931 accounts for the greater reduction of losses in those counties.

There was an average net loss per farm of $506 in 1932 on the 430 farms included in this report. Farm earnings in this area for several years are shown in Table 15, page 21.

For the state as a whole 1932 was the third successive year for which there was a net loss on the average of all Illinois farms. In spite of this fact production from Illinois farms has remained at normal levels in contrast to the drastic reduction in output from most other industries. Analyses of cost accounting records show why the individual farmer continues to produce at normal rates even though prices are expected to be drastically low. It is because most of his costs are of such a nature that he cannot avoid them by shutting down operations. Also, each producer furnishes so small a part of the supplies reaching his market that he cannot expect to cause a higher price by withholding a part of his products. It is only by group action which either rewards the individual for reducing production or forces him to reduce that any material decrease can be expected. The cash costs which can be avoided by not operating the land amount of from 10 to 20 percent of the total costs in the case of common farm crops grown in Illinois.

Other industries than farming also suffered a further slump for 1932. The earnings of a group of 840 industrial corporations reported by a nationally known bank show an average net loss of one-tenth of one percent on their invested capital for 1932. The average rate of return on capital invested in these corporations was 13.4 percent in 1929, 7.1 percent in 1930, and 3.3 percent in 1931.

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*The 430 farms included in this report are all on the higher-valued land of the area. Most of the tillable land on these farms is of the brown silt loam soil type. The records of 97 other farms on the lower-valued land in these counties are included in a report entitled, "Report of the Farm Bureau-Farm Management Service for 97 Farms on the Lower-Valued Land of North Central Illinois." Records of all the farms in the Farm Bureau-Farm Management Service in all twelve counties named in the first paragraph are included in these two reports.

Capital Investments

The average total capital investment in these 430 farms was $45,705. This includes the land at about $139 per acre for the bare land which is less than pre-war value.[1] The larger total investments on the more profitable farms are because the farms are larger as shown in Table 4, page 7. Farms with large investments in cattle and hogs tended to fall into the more profitable groups of farms. The investments in cattle were more than twice as great and in hogs more than one-half greater on the more profitable farms than on the less profitable farms.

Receipts and Net Increases

Taking inventory changes into account, the total receipts and net increases amounting to $3,238 were nearly four times as large per farm on the 86 most profitable as on the 86 least profitable farms. While the total livestock receipts on the more profitable farms were nearly four times those on the less profitable farms, the livestock investments were only about 65 percent greater. The receipts from cattle were 14 times as great, from hogs two and one-half times as great, and the receipts from dairy products were three times as great on the more profitable as on the less profitable farms. The poultry and egg sales were nearly 70 percent larger on the more profitable farms.

Expenses and Net Decreases

While the total expenses and net decreases of $1,919 per farm on the most profitable farms were about 32 percent more than on the less profitable farms, the farms were 31 percent larger and had nearly four times the income. Any cooperator who finds that his expense on machinery and equipment was unusually large or small may well turn to Table 12, page 17, where he can compare this part of his farm record with that for other farms of the same size and having the same type of equipment.

Net Income From Investment and Management on the Inventory Basis

The average net loss on the investment amounted to $506 per farm. The 86 most profitable farms had small average net incomes of $678 per farm. The net losses on the 86 least profitable farms averaged $1,241 per farm, or $1,919 less than the average net income on the more profitable farms.

Net income on investment	Number of farms
Over $2 750	1
$2 749 to 2 250	3
2 249 to 1 750	4
1 749 to 1 250	4
1 249 to 750	17
749 to 250	32
249 to - 249	66
- 250 to - 749	139
- 750 to -1 249	108
-1 250 to -1 749	33
-1 750 to -2 249	18
-2 250 to -2 749	4
-2 750 or less	1

Efficiency in farm organization and operation still pays even though the average losses are appalling. The average difference of nearly $2,000 a farm between the one-fifth that made a little net income and the one-fifth that showed the greatest net losses was due largely to differences in efficiency in organization and management of the farms. One farm had a net income of $2,875 and another a net loss of $2,764. Including the average decline of $1,247 in the inventory values of livestock, grain, buildings, and equipment as shown in Tables 2 and 3, the distribution of the farms according to the net incomes and net losses is shown to the left.

1/ The value placed on land on farms in Livingston, McLean, Taxewell and Woodford Counties was reduced 25 percent from what it had been during previous years. This placed it on the same basis as in the other counties.

Higher-Valued Land--1932

Table 1.--Investments and Receipts, Expenses, and Earnings on Inventory Basis

Items	Your farm	Average of 430 farms	86 most profitable farms	86 least profitable farms
CAPITAL INVESTMENTS				
Land	$	$33 363	$35 087	$27 023
Farm improvements		5 615	6 282	4 938
Livestock total		2 518	3 221	1 954
Horses		523	516	471
Cattle		1 217	1 850	899
Hogs		582	682	426
Sheep		68	38	34
Bees		8	1	8
Poultry		120	134	116
Machinery and equipment		2 152	2 339	1 835
Feed, grain, and supplies		2 057	2 078	1 857
Total capital investment	$	$45 705	$49 007	$37 607
RECEIPTS AND NET INCREASES				
Livestock total	$	$ 1 676	$ 3 136	$ 856
Horses		---	---	---
Cattle		418	1 134	79
Hogs		677	1 001	406
Sheep		46	67	7
Bees		2	1	---
Poultry		52	63	40
Egg sales		107	146	84
Dairy sales		374	724	240
Feed, grain, and supplies		42	---	---
Labor off farm		52	90	34
Miscellaneous receipts		11	12	4
Total receipts & net increases	$	$ 1 781	$ 3 238	$ 894
EXPENSES AND NET DECREASES				
Farm improvements	$	$ 245	$ 238	$ 229
Horses		16	15	29
Productive livestock decreases		---	---	---
Machinery and equipment		414	435	375
Feed, grain, and supplies		---	155	66
Livestock expense		46	59	34
Crop expense		148	169	120
Hired labor		308	390	198
Taxes		401	397	343
Miscellaneous expenses		55	61	55
Total expenses & net decreases	$	$ 1 633	$ 1 919	$ 1 449
RECEIPTS LESS EXPENSES	$	$ 148	$ 1 319	$ -555
Total unpaid labor		654	641	686
Operator's labor		509	508	512
Family labor		145	133	174
Net income from investment and management		-506	678	-1 241
RATE EARNED ON INVESTMENT	%	-1.11%	1.38%	-3.30%
Return to capital and operator's labor and management		3	1 186	-729
5% of capital invested		2 285	2 450	1 880
LABOR AND MANAGEMENT WAGE	$	$-2 282	$-1 264	$-2 609

Farm Earnings on the Cash Basis

The balance between the cash farm receipts and the cash farm expenses is the amount left and used mainly for the payment of debts, interest on debts, family living expenses, and life insurance. The average cash balance per farm was $1,395. On rented farms this is divided between tenant and landlord. On the 86 more profitable farms there was a balance of $2,226 per farm as compared with only $754 on the 86 less profitable farms. This difference of $1,472 a farm represents the difference in cash income available for those dependent on the farms for the payment of debts and family expenses.

A much larger average cash business was done on the farms that proved most profitable. The 86 most profitable farms had $3,238 cash expenses and $5,464 receipts per farm, while the 86 least profitable farms spent only $1,462 and received only $2,216 per farm. The greatest differences in purchases were in feeder cattle, feed, hired labor, and machinery and equipment. The more important differences in sales were in the amounts of beef cattle, hogs, and dairy products.

Inventory Changes

While the average cash balance was $1,395 per farm, decreases in farm inventories amounting to $1,247 brought the receipts and net increases less expenses and net decreases down to only $148 per farm. This lacks $506 of being enough to pay for the labor of the operator and other members of the family at hired man's wages, and leaves nothing to pay for management, risks, and interest on the investment, which at 5 percent would amount to $2,285 per farm. See pages 2 and 3. A more complete study of inventory changes is made in Table 2.

Table 2.--Changes in Farm Inventories

Items	Average of 430 farms		86 most profitable farms		86 least profitable farms	
	First of year	End of year	First of year	End of year	First of year	End of year
Land	$33 363	$33 363	$35 087	$35 087	$27 023	$27 023
Farm improvements	5 615	5 462	6 282	6 178	4 938	4 798
Total livestock	2 518	2 310	3 221	3 147	1 954	1 698
Machinery and equipment	2 152	1 956	2 339	2 163	1 835	1 654
Feed, grain, and supplies	2 057	1 367	2 078	1 525	1 857	1 125
Total inventories	$45 705	$44 458	$49 007	$48 100	$37 607	$36 298

Family Living Furnished by Farm

The family living furnished by the farm, when figured at the wholesale prices for which the products could have been sold, amounted to about $230 a farm or $48 a person in the farm family. This is not included in the receipts from the farm as shown in Table 1. This item may be considered as labor income for the farm operator and other members of the family in addition to the labor wages deducted in the accounts. Under present conditions the retail price of foodstuffs that farmers buy is high as compared with the farm price of farm products sold. Under such conditions many farm families may very profitably increase the portion of their food for summer and winter use that they produce on the farm. This subject is discussed more in detail on page 18.

Higher-Valued Land--1932

Table 3.--Farm Earnings on Cash Basis--Inventory Changes--Family Living Furnished by Farm

Items	Your farm	Average of 430 farms	86 most profitable farms	86 least profitable farms
CASH RECEIPTS				
All livestock	$	$ 2 402	$ 4 262	$ 1 295
Horses		37	37	21
Cattle		811	1 890	293
Hogs		889	1 227	561
Sheep		93	134	16
Bees		3	1	1
Poultry		88	103	79
Eggs		107	146	84
Dairy products		374	724	240
Feed, grain, and supplies		960	909	804
Farm improvements		2	5	1
Machinery and equipment		120	186	78
Labor off the farm		52	90	34
Miscellaneous receipts		11	12	4
Total cash receipts	$	$ 3 547	$ 5 464	$ 2 216
CASH EXPENSES				
Farm improvements	$	$ 93	$ 140	$ 90
Horses bought		25	20	18
Cattle bought		385	873	126
Hogs bought		46	69	44
Sheep bought		54	75	1
Bees bought		1	---	---
Poultry bought		23	29	23
Machinery and equipment		339	446	272
Feed, grain, and supplies		228	510	138
Livestock expense--other than feed		46	59	34
Crop expense		148	169	120
Hired labor		308	390	198
Taxes		401	397	343
Miscellaneous expenses		55	61	55
Total cash expenses	$	$ 2 152	$ 3 238	$ 1 462
CASH BALANCE FOR YEAR	$	$ 1 395	$ 2 226	$ 754
Inventories--beginning of year		45 705	49 007	37 607
Inventories--end of year		44 458	48 100	36 298
Change in inventories		-1 247	-907	-1 309
Receipts and net increases less expenses and net decreases		148	1 319	-555
FAMILY LIVING FURNISHED BY FARM				
Farm products used in home	$	$ 230	$ 243	$ 227
Number in family		4.8	5.1	5.0
Farm products used per person	$	$ 48	$ 48	$ 45

Size of Business

The standard of living of the farm family is largely dependent on the net income of the farm business over a period of years. Even though a farm may be efficiently operated, the total size or volume of business may be so small as to give an inadequate income. A fair to large size of business is, therefore, necessary if a good standard of living is to be provided for the farm family. The total amount of labor required to care for the crops and livestock produced on the farm is one of the most satisfactory measures of the size of the farm business. This takes into account the percent of the farm in crops, the kind of crops, the amount and kind of livestock kept, as well as the size of the farm.

The man work unit is used as a measure of the amount of labor required. A man work unit is a measure of the amount of work a man will normally do in one ten-hour day. The average amounts of work done in one ten-hour day used in calculating the number of man work units of labor performed on these farms are based on detailed cost records kept during several years on about 20 Champaign and Piatt County farms. Tables showing the average time required for each of the crops and kinds of livestock and explanations of their use are given on page 16.

As compared with the 86 less profitable farms, the 86 more profitable farms were 31.3 percent larger and required at average efficiency 34.3 percent more labor on crops. They used more than twice as much feed and required 71.5 percent more labor on productive livestock. Altogether the more profitable farms had work that required 48.5 percent more hours of labor than the less profitable farms.

Intensity of Business--A fairly large business may be conducted on a small-sized farm by following an intensive type of farming such as dairying, poultry raising, or truck farming. A very large livestock business of most any kind may be developed on a relatively small farm by buying feed. The more profitable farms were not only larger and had more livestock than the less profitable farms, but they also conducted a more intensive business. This is shown by the $8.17 more gross income per acre, the $2.94 an acre more feed used, the 53.2 pounds an acre more pork produced, and the .24 more man work units per acre. The more livestock on the more profitable farms enabled the operators to distribute their labor to better advantage.

Investments per Acre--The appraised value of the bare land was slightly lower on the 86 most profitable farms than on the 86 least profitable farms. The value of farm improvements was also slightly lower on the most profitable farms. The investment per acre in productive livestock was nearly 40 percent larger on the 86 most profitable farms, but the investments in horses and machinery and equipment were lower on the most profitable farms.

Expenses per Acre--The total of the selected items of expense per acre as shown in Table 4, page 7, is one of the best measures that the individual cooperator can use to determine whether his expenses are running about as they should. These expenses averaged $9.45 on the more profitable and $10.60 on the less profitable farms. If they are particularly high or low on any farm, a glance down the column will enable one to see what items are responsible for the difference. If the acre expense for machinery and equipment is high, the cooperator may well turn to Table 12, page 17, to learn if the cause of the high expense lies in the auto, truck, tractor, or other machinery.

Higher-Valued Land--1932

Table 4.--Size of Business--Intensity of Business--Investments per Acre--Expenses per Acre--Expense per $100 Gross Income

Items	Your farm	Average of 430 farms	86 most profitable farms	86 least profitable farms
SIZE OF BUSINESS				
Total man work units		442.8	526.3	354.3
On crops		202.3	217.2	161.7
On productive livestock		209.6	279.7	163.1
On horses		30.9	29.4	29.5
Size of farm--total acres		239.5	252.7	192.5
Percent of farm tillable		89.7	90.0	90.1
Acres of farm in crops		190.5	200.8	152.7
Total investments	$	$45 705	$49 007	$37 607
Total receipts and net increases		1 781	3 238	894
Value of feed to livestock		1 228	1 847	841
INTENSITY OF BUSINESS				
Gross receipts per acre	$	$ 7.44	$ 12.81	$ 4.64
Total expenses per acre		9.55	10.13	11.09
Net income per acre		-2.11	2.68	-6.45
Feed used per acre		5.13	7.31	4.37
Pounds of pork produced per acre		107.0	142.7	89.5
Man work units per acre		1.85	2.08	1.84
INVESTMENTS PER ACRE--TOTAL	$	$ 190.79	$ 193.93	$ 195.36
Real estate	$	$ 162.72	$ 163.71	$ 166.03
Land		139.28	138.85	140.38
Farm improvements		23.44	24.86	25.65
Operating capital	$	$ 28.07	$ 30.22	$ 29.33
Horses		2.18	2.04	2.45
Productive livestock		8.32	10.70	7.70
Machinery and equipment		8.98	9.26	9.53
Feed, grain, and supplies		8.59	8.22	9.65
EXPENSES PER ACRE--TOTAL	$	$ 9.55	$ 10.13	$ 11.09
Selected items of expense		9.48	9.45	10.60
Farm improvements		1.02	.94	1.19
Machinery and equipment		1.73	1.72	1.95
Miscellaneous livestock expense		.19	.23	.18
Miscellaneous crop expense		.62	.67	.62
Hired and home labor		4.01	4.08	4.59
Taxes		1.68	1.57	1.78
Miscellaneous		.23	.24	.29
Livestock and grain decreases	$	$ .07	$ .68	$ .49
Horses		.07	.06	.15
Productive livestock		--	--	--
Feed, grain, and supplies		--	.62	.34
EXPENSE PER $100 GROSS INCOME	$	$ 128	$ 79	$ 239

The expense per $100 gross income is another good measure that enables one to know whether his expenses are unduly high or unusually low for the amount of the gross farm income.

Crop Yields

The yields of crops had more to do with placing farms in the high or low groups of farms than any other factor except efficiency of livestock. This is shown in Table 14, page 19. Year after year farm records have shown that crop yields and livestock efficiency have been the most important factors in determining net farm incomes in all parts of the state.

The advantage in yield of the 86 more profitable over the 86 less profitable farms was 7.4 bushels for corn, 5.8 bushels for oats, 1.7 bushels less for winter wheat, 6.6 bushels for spring wheat, 9.4 bushels for barley, and 1.7 bushels less for soybeans. These differences seem small, but when all were added together with similar differences for hay and pasture and average prices were applied, they were found to account for $355 a farm in favor of the more profitable farms.

A study of the records of the farms that have been in the Farm Management Service for seven years and that have shown most improvement indicates that changes in practices that have increased crop yields have had more to do with the increased incomes than any other factors excepting possibly those changes that influence livestock efficiency. Detailed cost of production studies show that the cost of producing a bushel of grain or a ton of hay decreases rapidly with increase in yield per acre. The operators of the most profitable farms are constantly on the alert to learn of new varieties of seed or new practices that will enable them to increase their yields per acre.

Cropping Systems

The profitableness of the cropping system is fairly well measured by the relative portions of tillable land in the higher, medium, and lower profit crops. The common crops grown in this area are listed in the higher, medium, and lower profit groups in Table 6, page 9, according to the same classification that has been used for the past seven years in Livingston, McLean, Tazewell, and Woodford Counties.

The more profitable group of farms had 1.6 percent more of the tillable land in the higher profit crops, 5.4 percent more in the medium profit crops, and 7.0 percent less in the lower profit crops than were found on the less profitable farms. Like the differences in yields, these differences seem small, but they are enough to have caused an average advantage of nearly $80 in favor of the more profitable farms. See Table 14, page 19.

There is probably no change that has been made during the past seven years on so many farms as the change to a definite cropping system that reduces the acreage of oats, timothy, and blue grass and increases the acreage of alfalfa, sweet clover, and corn. On most farms where the percent of tillable land in the higher profit plus one-half the medium profit crops is below the average there is opportunity to improve the farm income through a change in the cropping system.

Higher-Valued Land--1932

Table 5.--Crop Yields

Items	Your farm	Average of 430 farms	86 most profitable farms	86 least profitable farms
Grain crops--bushels per acre				
Corn		62.2	66.8	59.4
Oats		52.0	55.1	49.3
Winter wheat		23.7	24.4	26.1
Spring wheat		14.6	16.6	10.0
Barley		33.8	37.3	27.9
Soybeans		26.6	26.5	28.2
Hay crops--tons per acre				
Timothy		1.21	1.00	1.25
Clover		1.22	1.26	1.10
Alfalfa		2.94	3.13	2.67
Clover and timothy		1.49	1.67	1.29
Soybeans		2.18	2.24	2.05

Table 6.--Percent of Tillable Land in Higher, Medium, and Lower Profit Crops

Items	Your farm	Average of 430 farms	86 most profitable farms	86 least profitable farms
Percent of tillable land in				
Higher profit crops--total	____%	61.5 %	63.4 %	61.8 %
Corn		48.5	46.4	47.7
Winter wheat		2.6	3.8	2.6
Alfalfa		3.5	5.1	3.7
Sweet clover		5.4	5.4	6.1
Canning and miscellaneous		1.5	2.7	1.7
Medium profit crops--total	____%	14.5 %	16.9 %	11.5 %
Spring wheat		.8	.8	.6
Barley		4.0	6.1	2.8
Soybeans		2.5	3.3	1.8
Clover		2.9	2.0	2.6
Clover and timothy mixed		2.5	2.9	2.3
Miscellaneous		1.8	1.8	1.4
Lower profit crops--total	____%	24.0 %	19.7 %	26.7 %
Oats		20.8	16.3	23.4
Timothy		.9	.7	.8
Blue grass		2.0	2.4	2.2
Miscellaneous		.3	.3	.3
ALL HIGHER PLUS ONE-HALF MEDIUM	____%	68.8 %	71.8 %	67.6 %
Legumes left down		18.4	20.2	18.6
Crop following first year sweet clover		4.8	5.1	3.9

Amount and Efficiency of Productive Livestock

The value of feed fed per acre to productive livestock gives an idea of the relative importance of the livestock enterprise to the whole farm business. The total amounts of feed fed to and the total returns from productive livestock indicate the total size of the livestock enterprise. In the analysis in Table 7, page 11, the total returns from each class of livestock include the products used on the farm as well as those sold.

Efficiency of livestock production as measured by the returns for each $100 of feed fed to all productive livestock apparently had more effect on net farm incomes than any other one factor. See Table 14, page 19. The livestock efficiency index shows the relative efficiency of all livestock better than any other factor. It takes into account the amount of each kind of livestock as well as the returns for feed fed. The more profitable farms received 27 percent more and the less profitable farms 15 percent less than the average of all farms for the same amounts of feed fed to the same kinds of livestock.

Cattle--The returns for feed fed to cattle vary so much with the proportion of the cattle that are cows being milked and those being fed for beef that it is difficult to compare the effidency of the cattle on one farm with others when only one account with all cattle on the farm is kept. It is believed, however, that the cattle efficiency index as used in Table 7 is a fair measure of relative efficiency.

The cattle efficiency index for any farm is the percent that the returns for $100 worth of feed fed to cattle on that farm is of the average returns for $100 worth of feed fed to cattle on farms where the number of cows milked bears the same relation to the total cattle-animal units as on that farm. Cattle efficiency was only 72 percent as high on the 86 least profitable farms as on the average of all farms, while it was 29 percent above average on the 86 most profitable farms.

The feed cost per 100 pounds of beef produced was approximately $4.50 on the farms where considerable beef was produced but very little milking done. The feed cost per 100 pounds of milk produced was about 65 cents on farms where few cattle other than milk cows were kept.

Hogs returned $152 for $100 of feed on the more profitable and only $113 on the less profitable farms. There was more than twice as much pork per farm produced on the more profitable than on the less profitable farms. It required 389 pounds of feed valued at $1.86 per 100 pounds of pork on the more profitable as compared with 468 pounds at $2.26 on the less profitable farms. The average returns were 27 cents per 100 pounds of pork greater on the more profitable farms.

Sheep production is a very minor enterprise on these farms, but what there were returned $120 more for each $100 of feed fed to them on the more profitable than on the less profitable farms. The poultry project was a larger enterprise on the more profitable than on the less profitable farms as shown by the 145 and 100 hens per farm on the respective groups of farms. The differences of $47 for each $100 invested in the poultry flock and of 7 eggs per hen in favor of the more profitable farms indicate that poultry flock efficiency was a worthwhile factor that contributed to the better incomes on the more profitable farms.

Higher-Valued Land--1932

Table 7.--Amount and Efficiency of Productive Livestock[1/]

Items	Your farm	Average of 430 farms	86 most profitable farms	86 least profitable farms
Total feed to all productive livestock.	$_____	$ 1 228	$ 1 847	$ 841
Cattle.		589(421)	1 028(82)	378(85)
Hogs.		521(397)	668(73)	391(84)
Sheep		99(159)	96(35)	46(26)
Poultry		69	86	57
Total feed used per acre.	$	$ 5.13	$ 7.31	$ 4.37
Total returns from productive livestock	$_____	$ 1 843	$ 3 318	$ 1 026
Cattle.		865	1 917	420
Hogs.		692	1 019	442
Sheep		126	167	25
Poultry		205	259	168
Total returns per acre.	$	$ 7.69	$ 13.13	$ 5.33
Returns per $100 feed to all livestock.	$_____	$ 150	$ 180	$ 122
Cattle.		147	186	111
Hogs.		133	152	113
Sheep.		127	174	54
Poultry		297	301	295
Total returns from all livestock if fed with average efficiency.	$	$ 1 843	$ 2 431	$ 1 222
Livestock efficiency index[2/].		100	127	85
CATTLE				
Pounds of beef produced[3/].		10 263(194)	24 362(35)	4 812(42)
Pounds of milk produced[3/].		36 722(194)	40 572(35)	31 521(42)
Total animal units in cattle.		20.5	30.4	14.6
Number of cows milked		6.5	8.6	5.6
Percent of units that were milked . .		31.7	28.4	38.4
Pounds of milk per cow.		6 894	7 353	6 689
Dairy returns per cow	$	$ 71	$ 94	$ 59
Cattle efficiency index[4/].		100	129	72
HOGS				
Pounds of pork produced		25 628	36 059	17 234
Returns per 100 lbs. pork	$	$ 2.67	$ 2.83	$ 2.56
Feed cost per 100 lbs. pork		2.02	1.86	2.26
Pounds of feed per 100 lbs. pork. . .		425	389	468
Pigs weaned per litter.		6.0	6.4	6.1
POULTRY				
Returns per $100 invested	$	$ 179	$ 201	$ 154
Number of hens.		117	145	100
Number of eggs per hen.		108	109	102

1/ A figure in parenthesis designates the number of farms which that item represents.

2/ The livestock efficiency index is the percent of the average returns from feed fed to all livestock weighted according to the amount of feed fed to each class of livestock. It is calculated by dividing the total returns from all productive livestock on a farm by the total returns from all livestock if each class had been fed with average efficiency.

3/ On farms where weights of both beef and milk were recorded.

4/ There was $_____ returned for every $100 of feed to cattle on farms where the percent of cattle units that were cows milked was the same as on your farm.

Labor, Power, and Machinery Costs

The labor efficiency index used in Table 8, page 13, and in the farm efficiency chart on page 15 indicates the number of days of productive work done per man on the individual cooperator's farm for each 100 days of productive work done per man on the average of farms having the same labor requirements on crops and on livestock. The man work units per man increase quite rapidly with the increase in the size of the farm and with the amount of livestock. The labor efficiency index will enable each cooperator to compare the amount of labor used on his farm with the amount used on farms like his as regards size and amount of livestock.

The labor cost per crop acre was slightly more on the more profitable group of farms than on the average of all farms. The labor efficiency as measured by the labor efficiency index was slightly lower. It should be noted, however, that with approximately the same amount of labor for the work done, the returns per acre were $5.37, or 72 percent greater.

Power and machinery--The horse and machinery cost per man work unit on any farm compared with that on other farms shows whether the horse power, mechanical power, and machinery cost is high or low in proportion to the amount of crops and livestock on that farm. The horse and machinery cost per man work unit decreases gradually as the amount of labor on crops increases and decreases very rapidly as the amount of labor on livestock increases in proportion to the work on crops.

The horse and machinery efficiency index takes into account the relation of the amount of labor on livestock to the amount of labor on crops. It is determined for any farm by calculating the percent that the horse and machinery cost per man work unit is of the cost per man work unit on that farm using the average farm having the same total man work units on crops and the same on livestock as that farm.

The individual cooperator may well study his costs for the use of auto, truck, tractor, other machinery, and labor as shown in Table 12, page 17. This will help some to locate the source of an unusually high or low horse and machinery efficiency.

Amounts and Prices of Some Products Sold

Only a small portion of the difference in earnings between the more profitable and the less profitable farms was due to differences in prices received for products sold. Some of the difference in the price of grain was due to difference in quality of grain sold rather than difference in time of selling. Several dairy farms did have a distinct advantage because of a better market for dairy products.

Some cooperators will find that the average price received for all products was an important factor in making their incomes high or low. However, it is rare that this is so important as crop yields, cropping system, livestock efficiency, or labor and horse power and machinery efficiency.

Table 8.--Labor, Power, and Machinery Costs

Items	Your farm	Average of 430 farms	86 most profitable farms	86 least profitable farms
LABOR				
Average number of men		1.88	2.03	1.73
Labor cost per month	$	$ 41.63	$ 40.81	$ 41.72
Labor cost per crop acre		4.93	4.96	5.68
Man work units per man		241.0	259.3	204.8
Labor cost per man work unit	$	$ 2.12	$ 1.89	$ 2.45
Labor efficiency index[1]		100	99	92
POWER AND MACHINERY				
Average number of work horses		5.6	5.4	5.4
Percent of farms with tractors		83.7	89.5	70.9
Percent of farms with trucks		39.8	48.8	27.9
Feed cost per workable horse	$	$ 26	$ 27	$ 26
Cost per crop acre				
Horse feed and depreciation	$	$ .86	$ .80	$ 1.11
Machinery		2.17	2.17	2.45
Horses and machinery		3.03	2.97	3.56
Labor, horses, and machinery		7.96	7.93	9.24
Horse and machinery cost per man work unit		1.31	1.13	1.54
Horse and machinery efficiency index[2]	_____	100	115	93

Table 9.--Amounts and Prices of Some Products Sold

Items	Your farm	Average of 430 farms	86 most profitable farms	86 least profitable farms
Amounts sold				
Corn--bushels		2 514	1 768	2 268
Oats--bushels		1 042	659	859
Wheat--bushels		157	214	123
Pork--pounds		25 666	34 908	17 101
Eggs--dozens		732	924	598
Milk--pounds		46 535	66 327	38 796
Prices received				
Corn--cents per bushel	$	$ .22	$ .21	$ .22
Oats--cents per bushel		.15	.15	.15
Wheat--cents per bushel		.41	.41	.40
Pork--dollars per 100 pounds		3.42	3.56	3.32
Eggs--cents per dozen		.16	.17	.15
Milk--dollars per 100 pounds		1.05	1.29	.90
Percent of average price received for all	_____ %	100 %	108 %	96 %

1/ There was an average of _____ man work units per man on farms having the same man work units on crops and the same on livestock as the farm for which this report was prepared.

2/ There was an average cost of $_____ per man work unit for horses and machinery on farms having the same man work units on crops and the same on livestock as the farm for which this report was prepared.

Explanation of the Farm Efficiency Chart
(See Chart on page 15)

The figure in any column just above the double line across the middle of the chart is for the middle farm of all the farms to which that factor applies; that is, there are as many farms above that figure as there are below it.

The figure in any column just above the top single line across the chart represents approximately the most efficient farm in the factor named at the top of that column. The figure at the bottom of each column of the chart represents approximately the least efficient farm in that factor.

The figure in any column just above the second from the bottom line across the chart represents approximately the most efficient of the one-fifth of the farms which are lowest in that factor. It also represents approximately the least efficient in the next to the lowest one-fifth of the farms in that factor.

Likewise, the figure in any column just above the next to the top line across the chart represents approximately the least efficient of the one-fifth best farms in that factor. It also represents approximately the most efficient of the second to the best one-fifth group of the farms in that factor. The other lines separate the middle group in each factor from the groups next to it.

By drawing a line across each column at approximately the place which represents the efficiency of his farm in each factor and then, by filling in with a colored crayon or pencil the space below such lines, a cooperator can see clearly where his farm stands in efficiency in each factor.

Table 10.--Relation of Net Income From Investment to Number of Factors in Which Farms Excel

Number of factors in which farms excel	Number of farms	Rate earned	Net income from average capital at rate earned of group
7	4	+2.76	$1 261
6	27	+ .73	334
5	57	+ .02	9
4	91	- .95	- 434
3	109	-1.65	- 754
2	86	-2.11	- 964
1	33	-2.24	-1 024
0	3	-3.80	-1 737

The following seven efficiency factors were used in the analysis shown in Table 10 above: (1) yield of corn; (2) percent of tillable land in high profit plus one-half of that in medium profit crops; (3) feed per acre to productive livestock; (4) livestock efficiency index; (5) labor efficiency index; (6) horse and machinery efficiency index; (7) total man work units per farm.

The four farms that were above the average of all 430 farms in the seven factors earned annually an average of 2.76 percent on the investment. The three farms that were below the average in all seven factors had an average loss of 3.80 percent. This difference of 6.56 percent amounts to $2,998 when applied to the average farm capital. The value of well-balanced farming in which all important parts of the business are done at least fairly well is clearly shown from these data.

Rate earned on investment	Gross income per acre	Factors that affect the gross income per acre: Bu. per acre: Corn	Oats		% tillable land in higher profit crop	Feed per acre to livestock	Cattle efficiency index	Hogs--returns per $100 feed	Sheep-returns per $100 feed	Poultry--returns per $100 invested	All livestock efficiency index	Price index	Man labor efficiency index	Horse and machinery efficiency index	Expense per $100 gross income	Size of business Total man work units
5.8	52	97	85		100	33	287	250	276	500	200	195	164	225	52	1120
The best one-fifth of the farms in each factor come between this line and the next line below.																
.0	12	71	61		76	8.10	130	170	151	269	127	106	115	133	100	550
The second best one-fifth of the farms in each factor come between this line and the next line below.																
-1.0	8.50	65	55		71	5.25	104	145	115	213	106	100	103	115	122	460
-1.4	7.50	63	52		69	4.35	94	137	95	93	100	98	99	107	137	420
The middle farm in each factor comes to this line.																
-1.8	6.80	61	50		67	3.80	85	127	83	175	93	95	94	101	149	385
The second lowest one-fifth of the farms in each factor come between this line and the next line below.																
-2.6	5.20	53	43		61	2.70	68	109	24	139	82	90	86	84	189	315
The lowest one-fifth of the farms in each factor come between this line and the bottom line.																
-5.0	1.50	39	22		39	.50	-9	-7	-143	30	30	69	53	46	520	170

Analysis of Horse Power, Mechanical Power, and Machinery Costs

Horse power, mechanical power, and machinery costs on corn-belt farms make up a larger part of all farm operating costs than any other single item except labor. It has been difficult for many who have cooperated in the Farm Management Service to see wherein their horse and machinery costs were particularly high or low. In order to analyze these costs more completely the farms on the higher-valued lands have been grouped according to the size of farm and use of tractor and truck in Table 12, page 17.

By comparing the records of his farm with the average of other farms of the same size and having the same type of power and equipment as his, each cooperator may locate rather definitely the places that his horse and machinery costs are particularly high or low. The information in this table is presented only for the purpose indicated. The data as presented should not be used as a means of drawing conclusions regarding the relative profitableness of farming with or without tractors or trucks, or on different sizes of farms.

Man Work Units per Man, a Measure of Labor Efficiency

The measure of labor efficiency used in this report is based on the average number of man work units worked per man during a full year of twelve months. A man work unit is a measure of the average amount of work done in one ten-hour day. The amounts of work done in a ten-hour day used in calculating the number of man work units of labor performed on these farms are based on detailed cost records kept during the five years, 1927 to 1931, on about 20 farms in Champaign and Piatt Counties and on dairy enterprise studies in north central Illinois for 1928 and 1929.

Table 11.--Standards for Calculating Man Work Units

Crops			Livestock		
Kind of crop	Man hours per acre	Man work units per acre	Kind of livestock	Man hours per animal unit	Man work units per animal unit
Corn	12.7	1.27	Cattle other than cows milked	22.0	2.2
Oats	6.2	.62	Cows milked by hand	124.2	12.4
Wheat (winter)	8.6	.86	Cows milked with machine	94.6	9.5
Wheat (spring)	7.1	.71	Hogs (per 100 pounds produced)	2.56	.256
Rye	8.6	.86			
Barley	7.1	.71			
Soybeans	9.9	.99			
Alfalfa	15.0	1.50	Sheep	18.6	1.86
Clover	9.2	.92	Poultry	204.0	20.40
Timothy	8.8	.88	Horses	49.3	4.93
Soybean hay	16.6	1.66			
Sweet corn 1/	12.7	1.27			
Canning peas 1/	12.0	1.20			
Truck crops 1/	100.0	10.00			

In Table 11 is given the standard number of hours of man labor required throughout the year to care for one acre of each crop or for an animal unit of each kind of livestock. In this study, one animal unit consists of one mature horse or cow, 2 colts or calves or yearling cattle in the breeding herd, 2 feeder

1/ Estimates

Table 12.--Analysis of Horse Power, Mechanical Power, and Machinery Costs
Averages of three years of 1929, 1930 and 1931

Items	Your farm	Farms under 180 acres			Farms of 180 to 299 acres			Farms of 300 acres or more		
		With tractor and truck	With tractor without truck	Without tractor or truck	With tractor and truck	With tractor without truck	Without tractor or truck	With tractor and truck	With tractor without truck	Without tractor or truck
Number of farms		24	39	30	47	60	10	22	27	1
Investments										
Truck	$	$ 185	---	---	$ 261	---	---	$ 322	---	---
Auto		169	$ 149	$ 123	176	$ 207	$ 135	224	$ 179	$ 65
Tractor		472	456	---	462	539	---	764	602	---
Other machinery		1 282	1 060	716	1 356	1 276	920	2 053	1 589	1 727
All machinery		2 108	1 665	839	2 255	2 022	1 055	3 363	2 370	1 792
Horses		349	379	524	547	490	601	613	688	1 370
Horses and machinery		2 457	2 044	1 363	2 802	2 512	1 656	3 976	3 058	3 162
Expenses and net decreases										
Truck	$	$ 75	---	---	$ 93	---	---	$ 117	---	---
Auto		64	$ 78	$ 71	86	$ 90	$ 182	69	$ 85	$ 84
Tractor		131	122	---	154	168	---	252	227	---
Other machinery		143	156	99	183	175	128	291	214	276
Total machinery cost		413	356	170	516	433	210	729	526	360
Horse feed and depreciation		115	119	171	169	171	187	175	188	373
Machinery and horse cost		528	475	341	685	604	397	904	714	733
Labor cost		747	715	688	910	966	870	1 283	1 198	1 523
Labor, machinery & horse cost		1 275	1 190	1 029	1 595	1 570	1 267	2 187	1 912	2 256
Expenses per acre of crops										
Machinery	$	$ 3.44	$ 2.92	$ 1.61	$ 2.70	$ 2.33	$ 1.32	$ 2.44	$ 1.78	$ 1.54
Horse feed and depreciation		.96	.97	1.62	.89	.92	1.18	.59	.63	1.59
Machinery and horses		4.40	3.89	3.23	3.59	3.25	2.50	3.03	2.41	3.13
Labor		6.22	5.86	6.51	4.77	5.20	5.49	4.30	4.05	6.51
Labor, machinery & horses		10.62	9.75	9.74	8.36	8.45	7.99	7.33	6.46	9.64
Total acres in farm		151.4	152.3	136.6	236.4	228.5	201.4	376.6	386.4	300.0
Acres in crops		120.0	122.0	105.7	190.8	185.8	158.6	298.2	296.0	234.0
Feed per acre to livestock	$	$ 6.92	$ 7.01	$ 4.89	$ 4.56	$ 5.42	$ 4.01	$ 5.29	$ 4.24	$ 8.61

cattle, 5 mature sheep, 10 to 15 lambs or feeder sheep, and 100 hens. The number of each class of livestock was calculated for each farm by taking the average of the numbers on hand at the beginning and at the end of the year.

Value of Farm Products Used in the Farm Home

The amounts of farm products used in the homes of the cooperators have been estimated and recorded from month to month. The average total value of such products at the farm selling prices amounted to $230 per farm for the 430 farms on which such records were kept, as shown in Table 3, page 5.

The prices used were approximate wholesale farm prices as follows: milk, 8 cents per gallon, or about 92 cents per 100 pounds; cream, 8 cents per pint; butter, 22 cents per pound; eggs, 16 cents per dozen; poultry and other meats, live weight farm price at the time slaughtered; and potatoes 50 cents per bushel. The value of other vegetables was estimated according to the size and quality of the garden and the number of persons in the family during the garden season. This estimate was based on studies made in former years by the Division of Farm Organization and Management in connection with detailed cost account investigations. Ten cents per quart was used in case of all vegetables and fruits produced on the farm and canned or preserved for winter use.

The value of these farm products used in the home was not included in the farm receipts as shown in Table 1, page 3. However, the values of the poultry and livestock products were included in the returns from each class of livestock in figuring the livestock efficiency factors as shown in Table 7, page 11.

Table 13.--Family Living Secured From Farm
Amounts and Values of Products Used per Person in Families of 4 to 6 Persons

Items	Average of 255 farms		55 farms with most per person		55 farms with least per person	
	Amount per person	Value per person	Amount per person	Value per person	Amount per person	Value per person
Fuel	---	$ .64	---	$ 1.04	---	$ .12
Milk	265 qts.	5.30	305 qts.	6.10	238 qts.	4.77
Cream	42 pts.	3.38	70 pts.	5.58	24 pts.	1.96
Butter	23 lbs.	5.01	34 lbs.	7.38	11 lbs.	2.52
Eggs	40 doz.	6.35	52 doz.	8.30	28 doz.	4.41
Poultry	---	3.71	---	5.59	---	2.37
Beef	---	2.02	---	4.30	---	.40
Pork (live weight)	178 lbs.	6.09	236 lbs.	8.06	124 lbs.	4.24
Mutton	---	.19	---	.40	---	.18
Honey	---	.09	---	.09	---	.09
Potatoes	4.0 bu.	1.94	5.7 bu.	2.87	2.8 bu.	1.42
Other vegetables	---	7.90	---	8.80	---	7.58
Fresh fruits	---	.79	---	1.44	---	.34
Canned fruits and vegetables	46 qts.	4.56	61 qts.	6.13	34 qts.	3.41
Miscellaneous	---	.01	---	.03	---	---
Total	---	$47.98	---	$66.11	---	$33.81

The amounts of farm products used in the home vary greatly from farm to farm. The records for 255 farms on which the families are of rather uniform size of four to six persons are analyzed in Table 13. Those 55 families that used the most produce consumed about twice as much that was grown on the farms as that used by 55 other families.

If the 55 families of five persons each that used the least home-grown food had purchased the balance in stores at retail, it would have cost about $300 per family per year. There is good opportunity for many farm families to save much cash expense and to live better by using more home-grown food.

Location of Differences in Income Between the More Profitable and the Less Profitable Farms

Much of the difference of $2,139 in the average net earnings between the 86 most profitable and the 86 least profitable farms is accounted for in Table 14.

Quality of land. The 430 farms used in this report are all on the better corn lands of north central Illinois. In a few cases there is some rough pasture land in addition to the good farm land. It is shown in Table 4, page 7, that the average value of land in the two groups was almost the same. The proportions of tillable land and of tillable land in crops were also approximately the same.

Table 14.--Location of Differences in Incomes Between the 86 Most Profitable and the 86 Least Profitable Farms

Factors considered	Average difference
Efficiency of livestock	$ 712
Crop yields	355
Amount of livestock	352
Cost of man labor	134
Cost of power and machinery	113
Miscellaneous expenses	98
Cropping system	78
Price of grain	- 24
Total located differences	$1 818
Differences in net incomes--4.68 percent of average capital	$2 139

Efficiency of livestock--The 86 more profitable farms realized $180 from each $100 worth of feed fed to productive livestock while the 86 least profitable farms received only $122 or a difference of $58 for each $100 worth of feed used. The average amount of feed used on all farms was valued at $1,228 at farm prices. The larger returns for each $100 of this feed used on the more profitable farms account for $712 difference in average income between the two groups of farms. This does not include the cost of keeping horses on the two groups of farms. About 61 percent of the grain produced on these farms was fed, the rest being sold as grain. On farms where more of the grain is fed, livestock efficiency becomes relatively more important.

Crop yields--The 86 most profitable farms produced 7.4 bushels more of corn, 5.8 bushels more of oats, and proportionately higher yields of other crops than the 86 least profitable farms as shown in Table 5, page 9. When these differences are multiplied by the acres grown on the average of the farms and by

the average farm prices, it is found that there was a total difference of $355 in favor of the more profitable farms.

Amount of livestock--There was $2.94 more feed fed per acre on the more profitable than on the less profitable farms. This accounts for about $352 more income on the more profitable farms. The relation of prices of feed and livestock was more favorable for livestock farms in 1932 than for any year since 1926. This is shown in the returns for $100 of feed fed during each of the past eight years in Table 15, page 21.

Cost of man labor--The total labor cost, including the operator's and family labor at hired man rates was $3.94 an acre on the 86 most profitable farms and $4.50 on the least profitable ones. This difference of 56 cents an acre applied to the average size of all farms amounts to $134 in favor of the more profitable farms.

Cost of power and machinery--The total cost per acre of horse and mechanical power and machinery was only $2.36 on the 86 most profitable farms as compared with $2.83 on the 86 least profitable farms. This difference of 47 cents per acre would amount to $113 less cost per farm in favor of the more profitable farms.

Miscellaneous expenses--Expenses other than for labor and power and machinery amounted to $3.65 and $4.06 an acre on the high and low groups of farms respectively. This difference of 41 cents an acre accounted for $98 difference in expense in favor of the more profitable farms.

Cropping system--The calculated advantage that the 86 most profitable farms had because of better cropping systems amounted to $78 per farm per year. This analysis is based on the acreages, yields, and values of all grains, hay, and pasture crops grown on these farms. Only a part of the data on which the analysis is based is included in this report. Most of the advantage that the more profitable had over the less profitable farms was in larger acreages of wheat, barley, soybeans, alfalfa, and canning crops and smaller acreages in oats and timothy.

Prices of grain--The 86 more profitable farms received an average of one cent a bushel less for corn, the same for oats, and one cent a bushel more for wheat than the 86 less profitable farms. These differences applied to the amounts sold on the average of all farms accounted for $24 in favor of the less profitable farms.

The difference of 24 cents per 100 pounds of pork, of two cents per dozen of eggs, and of 39 cents per 100 pounds of milk as shown in Table 10, page 15, applied to the amounts sold on the average farm gave an advantage of $258 to the more profitable farms. This is not included in the analysis in Table 14, page 19, because it is a part of the $712 advantage of the better farms because of livestock efficiency.

Comparison of Eight Years' Records

The records kept by cooperators in the Farm Bureau-Farm Management Service in Livingston, McLean, Tazewell, and Woodford Counties during the past eight years show clearly the effect of the depression on farm incomes. About 100 of the farms included in the analysis on page 21 continued in the Service throughout the eight years. The net income for the capital invested, risk, and management

Table 15.--Comparison of Eight Years' Records of Farms in the Farm Bureau-Farm Management Service in Livingston, McLean, Tazewell, and Woodford Counties

Items	1925	1926	1927	1928	1929	1930	1931	1932
Number of farms	225	210	200	150	380	380	352	190
Size of farm in acres	232.0	232.1	231.5	234.6	227.6	230.6	237.5	237.4
Rate earned on investment	3.21	2.80	3.72	5.66	5.56	.97	-.91	-1.24
Total investment an acre	258.15	255.93	253.81	251.74	246.12	248.21	240.67	234.92
Gross income an acre	22.05	20.74	22.78	27.86	27.17	15.43	9.25	6.84
Total expense an acre	13.77	13.57	13.33	13.60	13.49	13.01	11.45	9.76
Net income an acre	8.23	7.17	9.45	14.26	13.68	2.42	-2.20	-2.92
Cash receipts--total	7 239	6 390	6 283	7 133	7 251	6 172	4 064	3 251
Livestock, except dairy and poultry	3 182	2 958	2 569	2 957	2 881	2 427	1 783	1 402
Dairy products	346	353	380	469	612	583	452	379
Poultry and eggs	268	265	291	341	349	292	228	191
Feed, grain, and supplies	3 218	2 640	2 850	3 175	3 137	2 592	1 417	1 116
Machinery and equipment	95	101	96	99	168	160	106	98
Labor off farm and miscellaneous	130	73	97	92	104	118	78	65
Cash expenses--total	3 824	3 443	3 283	3 799	3 935	3 288	2 371	1 963
Livestock bought	831	734	630	818	787	480	381	428
Feeds	369	346	345	461	456	444	293	192
Machinery and equipment	728	620	607	723	912	775	407	299
Farm improvements	400	257	290	354	394	309	130	93
Livestock, crops, and other expense	335	352	350	365	376	330	301	231
Hired labor	668	634	573	612	564	479	369	300
Taxes	493	500	488	461	446	471	490	425
Cash balance for year	3 415	2 947	3 000	3 334	3 316	2 884	1 693	1 283
Changes in inventories	-573	-368	+138	+947	+708	-1 421	-1 462	-1 302
Receipts less expenses	2 842	2 579	3 138	4 281	4 024	1 463	231	-19
Bushels of corn per acre	55.3	51.3	42.0	53.0	46.2	36.1	47.9	58.4
Percent of land in high profit crops	58.2	60.1	59.9	60.8	61.4	61.9	64.4	63.7
Percent of land in medium profit crops	9.8	7.4	13.2	15.1	13.9	13.4	12.8	12.0
Percent of land in low profit crops	32.0	32.5	26.9	24.1	24.7	24.7	22.8	24.3
Returns per $100 feed to livestock	151	160	135	142	144	126	119	152
Pounds of pork produced an acre	66.8	64.0	74.0	76.0	73.7	72.0	83.2	88.4
Pounds of milk per cow	---	---	---	---	6 166	6 574	7 404	7 056
Number of eggs per hen	---	85.4	93.8	92.5	94.0	93.5	102.2	113.4
Hired and home labor per crop acre	8.65	8.33	8.28	8.27	8.14	7.29	5.77	4.98
Horse and machinery cost per crop acre	6.05	5.50	5.52	5.54	5.35	5.07	3.83	2.92

dropped from 5.66 percent of the investment in 1928 to a loss of 1.24 percent in 1932. The land values used in this analysis were held constant at pre-war values throughout the eight years.

The balance between the sales and the cash expenses kept close to $3,000 per farm per year from 1925 to 1929 and then dropped to $1,283 in 1932. The receipts and net increases less the expenses and net decreases increased from $2,842 in 1925 to over $4,000 in 1928 and 1929 and then dropped to a loss of $19 a farm in 1932.

There was a marked increase in the production of dairy products and of pork on these farms during the eight years. There was also an increase in the percent of tillable land in the high and medium profit crops and a corresponding decrease in the low profit crops.

The decreased farm buying power is shown clearly by the marked decrease in purchases of machinery and equipment and farm improvements which include purchases of limestone and rock phosphate for soil improvement. Taxes remained fairly constant with a little reduction in 1932.

Organization and Purpose of the Farm Bureau-Farm Management Service

The Farm Bureau-Farm Management Service was first organized in Illinois during the latter part of 1924. The cooperators in the original project were farm bureau members of Livingston, McLean, Tazewell, and Woodford Counties. Its purpose is to assist the cooperating farmers to keep such farm accounts as will enable them to study the efficiency with which they are conducting their farm business and to apply to their individual farms the practices in farm organization and operation which have proved profitable on other farms of a similar type. The project is an outgrowth of the regular farm management extension work in farm accounting begun in 1915.

The Service was organized in Henry, Knox, Peoria, and Stark Counties during the fall of 1929 and in Grundy, LaSalle, Marshall, and Putnam Counties during the fall of 1930. More farm accounting had been done in these areas of Illinois during previous years than in most parts of the state. Farm management tours have played an important part in developing interest in the work. The growing number of farmers keeping records has made it impossible for the College of Agriculture to give through the regular extension work the assistance desired by the farmers. This situation led to the organization of the Farm Bureau-Farm Management Service.

While the financial accounts kept in this service are similar to those used in the extension project in farm accounting, the additional records regarding cropping systems, crop and livestock production and feeds fed to each class of livestock and the personal contact with and assistance from the fieldman make the work of much more value to individuals. Additional records of practices followed in the production of each kind of crop and livestock and in the use of labor and power and machinery also make the Farm Bureau-Farm Management Service of more value to the cooperators than is the extension project in farm accounting.

The total average annual cost of this service is now about $30 per farm. The fees vary with the size of the farm, there being an increase of $1.00 per year for each 40 acres above 60 acres. Eight of the eleven farm bureaus have paid $5.00 per farm per year. They do this because of the value of the general information to all farm bureau members. It is true, however, that all individual records are kept confidential. The Division of Farm Organization and Management

of the University of Illinois, through salaries of those directing the work, clerical help, materials, printing, and other expenses incident to the work spends about $10 per farm per year on the project.

Advisory committees, composed of one representative from each farm bureau and the head of the Division of Farm Organization and Management plan and direct the work in the three areas where the work is organized. These committees employ the fieldmen from among those recommended by the University. The funds collected from the cooperators by the farm bureaus are held and expended by the advisory committees.

The fieldmen make four or five regular trips to all the farms during the year and meet the cooperators another time in the farm bureau office or other convenient place during January to check over the account books for the preceding year. On these visits they assist the men with their records and secure information about practices with crops and livestock. During the second and succeeding years they spend considerable time in studying the annual report with each cooperator and give extra time to those who wish special service in the way of reorganizing some parts of the farm business.

The Farm Bureau-Farm Management service throughout the state is under the direct supervision of M. L. Mosher, assistant professor of Farm Organization and Management. He assists the local farm bureaus in organizing the groups of cooperators and helps the fieldmen in planning and carrying out their work. He also supervises summarizing the farm account books, analyzing the data and preparing the annual reports.

As head of the Division of Farm Organization and Management, Professor H. C. M. Case gives general supervision to all of the work of the project. He meets with the advisory committees and assists in the preparation of the annual reports and in planning different phases of the work.

The organization of the project in this area was made possible by the hearty support and assistance of the farm advisers and their assistants.

The fieldmen, farm advisers and committeemen during the past year were as follows:

County	Fieldman	Adviser	Committeeman
Livingston	J. B. Andrews	S. G. Turner	R. R. Tombaugh
Woodford	" "	H. A. de Werff	J. Frank Felter
McLean	" "	R. J. Laible	B. C. Kraft
Tazewell	" "	R. E. Arnett	W. C. Sommer
Henry	F. A. Fisher	H. K. Danforth	J. P. Hanna
Knox	" "	A. R. Kemp	Ira Moats
Peoria	" "	J. W. Whisenand	Chas. W. Holmes
Stark	" "	W. A. Gilbert	J. A. Briggs
Grundy	J. B. Cunningham	R. V. Watson	Ed. N. Burnham
LaSalle	" "	C. E. Gates	R. E. Peddicord
Marshall-Putnam	" "	L. J. Hager	R. V. McKee

Printed in furtherance of the Agricultural Extension Act
approved by Congress May 8, 1914. H. W. Mumford,
Director, Agricultural Extension Service,
University of Illinois

SUMMARY REPORT

For the Cooperators in the
Farm Bureau-Farm Management Service
For the three year period of 1925, 1926 and 1927

Prepared by M. L. Mosher and H. C. M. Case

The improved farm land of East Central Illinois, the heart of the corn-belt, has had a productive value of approximately twenty dollars per acre including improvements on the land under conditions existing during the three years of 1925, 1926 and 1927. Since the buildings and fences on the average farm are invoiced at approximately forty-five dollars per acre of the entire farm, this means that farming has not been bringing a fair return on the value of the improvements alone. This same improved land had a productive value of about a hundred twenty-five to one hundred fifty dollars per acre before the world war.

This is a definite fact learned by the 206 cooperators who completed the three year Farm Bureau-Farm Management Service project. This was shown when their farm records were compared with the earnings on all farms in a township within these counties.

A second important fact shown from their three year records is that even under such conditions, a few individual farmers scattered here and there over the four counties of Livingston, McLean, Tazewell and Woodford, in which these cooperators are located, did operate their farms so as to have incomes which would be considered fair under normal conditions. However, men of similar ability in the industrial or professional world would have been rewarded by handsome incomes for their labor and management.

Those men who have been fairly successful are good farmers. They have spent from ten years to a generation in improving the soil, selecting good seed, establishing a good cropping system, developing efficient herds of live-stock, and in equipping their farms for economical operation in accordance with carefully thought out plans. This is not a thing that can be accomplished quickly. Even though it may require time to bring a farm from a low profit to a high profit farm, the difference in earnings on farms in the same community having similar natural advantages justifies the effort in developing a well-balanced farm.

Average Farm Earnings

An average of 3.3 percent on the entire farm investment, after deducting all expenses and $720 allowance for the value of the operator's labor, was made by the 175 farmers who are cooperators in the Farm Bureau-Farm Management Service and whose records were used in preparing this report. The average investment in land, buildings, livestock, and other equipment was $259.99 per acre with land valued at $195.12. Expressing the earnings in another way, these men after paying all expenses of operating their farms and allowing 5 percent interest charge on the investment lacked $296.39 per farm per year of getting any return for their own labor.

In addition to the above earnings each family secured produce from the farm which, based on records kept on the farms, amounted to $437.73 at farm prices. The investment in the farm residence and the expenses for repairs and upkeep on it were not included in these accounts. Therefore the use of the residence is not considered an income from the farm.

The income figures given in this report should not be considered as representative of all farms in these counties. A survey study of all farms in one township in McLean County in 1925 in about the center of the four counties included in this project, and similar studies of farm incomes made in Bond County in 1926 and in Henry County in 1927 indicate that the farms on which the records were kept in this project earned about 2 percent higher rate on the investment than the average of all farms in the same part of the state. It is on these records, that the opening statements of this report are based.

Differences in Earnings Between Farms

There are wide variations in the earnings on the most successful and the least successful farms. The 35 most profitable of the 175 farms made 5 percent interest on the investment and had an average of $1,268.39 per year to pay each operator for his own labor and management, while the 35 least profitable farms lacked $1,531.11 per year of making 5 percent on the investment and left nothing to the operator for his own labor and management.

This amounts to a total difference of $2,799.50 per farm per year in the return for the labor and management of the operators between the high and low groups of farms. This may be expressed in another way by saying, after all expenses were paid and the operator allowed $720 for his own labor, the most profitable group made 5.83 percent on the investment, while the least profitable group made only .93 percent on the money invested.

The one-fifth most profitable farms (35 farms) had an income of $28.75 an acre, while the one-fifth least profitable farms had an income of only $16.98 per acre (see Table 2). The total expenses per acre on the two groups of farms were $13.65 and $14.60 per acre respectively. In other words, the most profitable group of farms with $0.95 less expense per acre received $11.77 larger returns per acre. The same table shows that the least profitable farms were somewhat smaller in size on the average and that they had a little smaller investment per acre.

Two Opportunities for Increasing Farm Incomes

Farm earnings may be increased through "What the farmer can do for himself" and "What farmers can do in cooperation." While this report deals with the former, the latter means of helping farmers is important. It is concerned with such matters as the adjustment of tariffs, transportation rates and taxes and the handling of seasonal surpluses of agricultural products. These and similar problems require the organized effort of farmers if they are to present their case effectively before legislative and governmental boards and commissions and in conferences with other groups.

Regarding what the farmer can do for himself, that is concerned with the efficiency with which he operates his own farm business. The wide differences in earnings on farms included in this study operated under similar conditions of soil, climate and markets, show that the individuals have a large opportunity of improving their incomes. This can be accomplished through adopting

plans for the organization and operation of their farms which have proved most profitable. In fact the earnings on most farms can be increased more through increased efficiency in operation than through any rational adjustments of tariff, freight rates or taxes or improved handling of seasonal surpluses.

Greater farm efficiency, however, means higher yields of crops and higher returns from livestock for the feed fed, which tends to add to the surplus of agricultural products which may exist from time to time. If farmers in general adopted the most efficient practices it would tend to depress prices through some increased production. Our surplus agricultural production of recent years was a hold over from the quickened production during the world war. At present available data indicate that farm production is not keeping pace with the growth in population. As this situation continues for a time it will help raise farm prices to a better level for the welfare of the nation.

Increased efficiency on the best corn belt land is justified as a safe means of increasing the farm income as it is the most effective way of reducing the costs of production. Likewise it will be an effective way of discouraging further expansion of farming to cheap marginal land which should be held out of agricultural production under present conditions.

A careful study of his report by each cooperator will, it is believed, enable him to know rather definitely where he can most readily increase the efficiency of his farm business and how other farmers have more successfully conducted that part of the farm work.

Location of Differences in Incomes Between the More Profitable and the Less Profitable Farms

Most of the difference of approximately $3,000 in the average net earnings for each of the 35 most profitable and the 35 least profitable farms is accounted for in Chart 1.

Chart 1. Location of Differences in Incomes Between the 35 Most Profitable and the 35 Least Profitable Farms. Three-year data

Factors considered	The lengths of the shaded bars are in proportion to the amounts of the differences	Average difference in incomes
Crop yields	XXXX

Crop Yields - The yields per acre on the most profitable farms were: corn 53.9 bushels, oats 41.4 bushels and wheat 23.0 bushels. On the least profitable group the yields were: corn 45.2 bushels, oats 35.6 bushels and wheat 18.5 bushels. These differences of 8.7 bushels of corn, 5.8 bushels of oats, 4.5 bushels of wheat were applied to the average acreages of those crops on the 175 farms. With corn valued at the average three years' sale price of 76 cents per bushel, oats at 40 cents and wheat at $1.32, the total difference in value of the three crops on the average farm amounts to $831. (See Chart 1)

Amount of Livestock - The more profitable farms fed $13.27 worth of feed per acre, valued at farm prices, while $7.77 worth of feed per acre was fed on the less profitable farms. As an average of the two groups, for each $100 worth of feed fed there were livestock returns of $151.41; that is, the product from $100 worth of feed fed on the farm was worth $51.41 more than the farm price of the feed. This difference applied to the additional $5.50 worth of feed per acre used on the more profitable farms accounts for about $657.00 of the total difference between the two groups.

Efficiency of Livestock - The 35 more profitable farms realized $163.44 from each $100 worth of feed fed to productive livestock while the ~~40~~ 35 less profitable farms received only $135.34 or a difference of $28.10 for each $100 worth of feed used. The average amount of feed used on all farms was valued at $1982.90 at farm prices. The larger returns for each $100 of this feed used on the more profitable farms accounts for $557.19 of the difference in average farm income between the two groups of farms. This does not include the cost of keeping horses on the two groups of farms. This greater income to the more profitable farms for each $100 worth of feed used was apparent in case of each class of livestock. For beef cattle, the difference was $31.89, mixed beef and dairy herds $16.40, dairy herds $60.24, hogs $15.03, sheep $58.42, and poultry $65.22.

About one-half of the grain produced on these farms was fed, the rest being sold as grain. In areas where all the grain is fed on the farms, this matter of livestock efficiency becomes relatively more important.

Kinds of Crops Grown - The more profitable farms had a larger proportion of land in the more profitable crops of corn, wheat, alfalfa, sweet clover and canning crops but a smaller acreage of oats, bluegrass and timothy than were grown on less profitable farms. The differences in the relative proportions of corn, wheat and oats accounts for about $304. (See Chart 1).

Price of Grain - Such records were kept as enabled each cooperator to know the average price received during the three year period for his corn, oats, wheat and hogs. These four products made up approximately seventy per-cent of all sales. The prices received on the thirty-five most profitable farms were corn, 80.9 cents; oats, 40.3 cents; wheat, $1.34, and hogs, $11.14. In the least profitable group the prices were: corn, 72.7 cents; oats, 38.4 cents; wheat $1.24, and hogs $11.02. The average amounts of each product sold were: corn, 2607 bushels; oats, 1198 bushels; wheat, 247 bushels; and hogs, 15,910 pounds. The total difference in incomes due to the difference of 12.1 cents per 100 pounds in the price of hogs amounted to only $19.25. This difference appears as a part of the difference of $557.19 in livestock efficiency. The differences of 8.2 cents per bushel of corn, 1.9 cents per bushel of oats, and 9.9 cents per bushel of wheat account for the $280.23 of the difference in earnings between the two groups of farms.

Power and Machinery Costs - The total cost per acre of horse and tractor power and machinery on the most profitable farms amounted to only $4.25 per acre compared with a cost of $5.18 per acre on the least profitable farms. This difference in cost of power and machinery of 93 cents per acre would amount to a difference of $216.07 less cost per farm in favor of the most profitable farms.

Efficiency of Man Labor - The total labor cost, including the operator's and family labor at hired man rates, was $6.76 per acre on the 35 more profitable farms and $6.97 on the less profitable ones. This difference of 21 cents per acre applied to the average size of all farms amounts to only $48.79. This small difference is more significant when one realizes that the returns were nearly twice as high on the more profitable farms.

Other Expenses - Expenses other than labor, power and machinery amounted to $4.84 and $4.96 per acre on the respective groups of farms. This difference of 12 cents per acre accounted for only $27.88 in the differences in net incomes of the two groups of farms.

Table 1. SUMMARY OF THE THREE YEARS' FARM BUSINESS

The summary as shown on pages 34 and 35 of the farm account book compared with 175 farms, the 35 most profitable and the 35 least profitable farms.

	Items	Your farm	Average of 175 farms	35 most profitable farms	35 least profitable farms
1	Capital Investments - Total	$_____	$60,404.96	$63,693.09	$54,916.03
2	Land		45,334.26	48,340.97	40,877.57
3	Farm improvements		5,671.25	5,262.39	5,530.11
4	Machinery and equipment		1,903.33	1,825.26	1,912.06
5	Feed, grain and supplies		4,213.89	4,687.89	3,716.20
6	Livestock - Total		3,282.23	3,576.58	2,880.09
7	Horses		842.89	802.52	766.15
8	Cattle		1,141.09	1,001.00	924.76
9	Hogs		953.18	1,477.32	799.82
10	Sheep		170.83	151.58	228.68
11	Poultry		159.00	143.73	144.28
12	Bees		15.10	.43	16.40
13	Dogs		.14	----	----
14	Receipts - Net Increases-Total	$_____	$ 5,193.87	$ 7,077.20	$ 3,636.92
15	Farm improvements		---	---	---
16	Feed, grain and supplies		2,211.37	2,553.64	1,444.25
17	Labor off the farm		64.46	90.34	43.06
18	Miscellaneous		14.47	11.16	13.20
19	Livestock - Total		2,903.57	4,422.06	2,136.41
20	Horses		---	---	---
21	Cattle		559.83	654.09	444.79
22	Hogs		1,654.43	3,008.91	1,176.08
23	Sheep		70.81	73.73	76.84
24	Poultry		123.09	141.74	105.98
25	Egg sales		142.46	145.88	120.68
26	Dairy sales		347.22	397.45	208.10
27	Bees		5.50	.26	3.94
28	Dogs		.23	---	---
29	Expenses-Net Decreases-Total	$_____	$ 2,235.53	$ 2,488.53	$ 2,147.22
30	Farm improvements		257.37	245.29	268.03
31	Machinery and equipment		492.58	503.18	546.40
32	Feed, grain and supplies		---	---	---
33	Miscellaneous livestock expense		51.93	67.31	43.03
34	Miscellaneous crop expense		254.76	301.50	232.99
35	Hired labor		618.17	790.54	514.93
36	Taxes, insurance, etc.		506.01	526.40	468.93
37	Miscellaneous expenses		49.81	52.59	48.37
38	Horses - decreases		4.90	1.72	24.55
39	Miscellaneous livestock decreases		---	---	---
40	Receipts less expenses	$_____	$ 2,958.34	$ 4,588.67	$ 1,489.70
41	Operator's and family labor		942.68	872.01	979.58
42	Net income from investment	$_____	$ 2,015.66	$ 3,716.66	$ 510.12

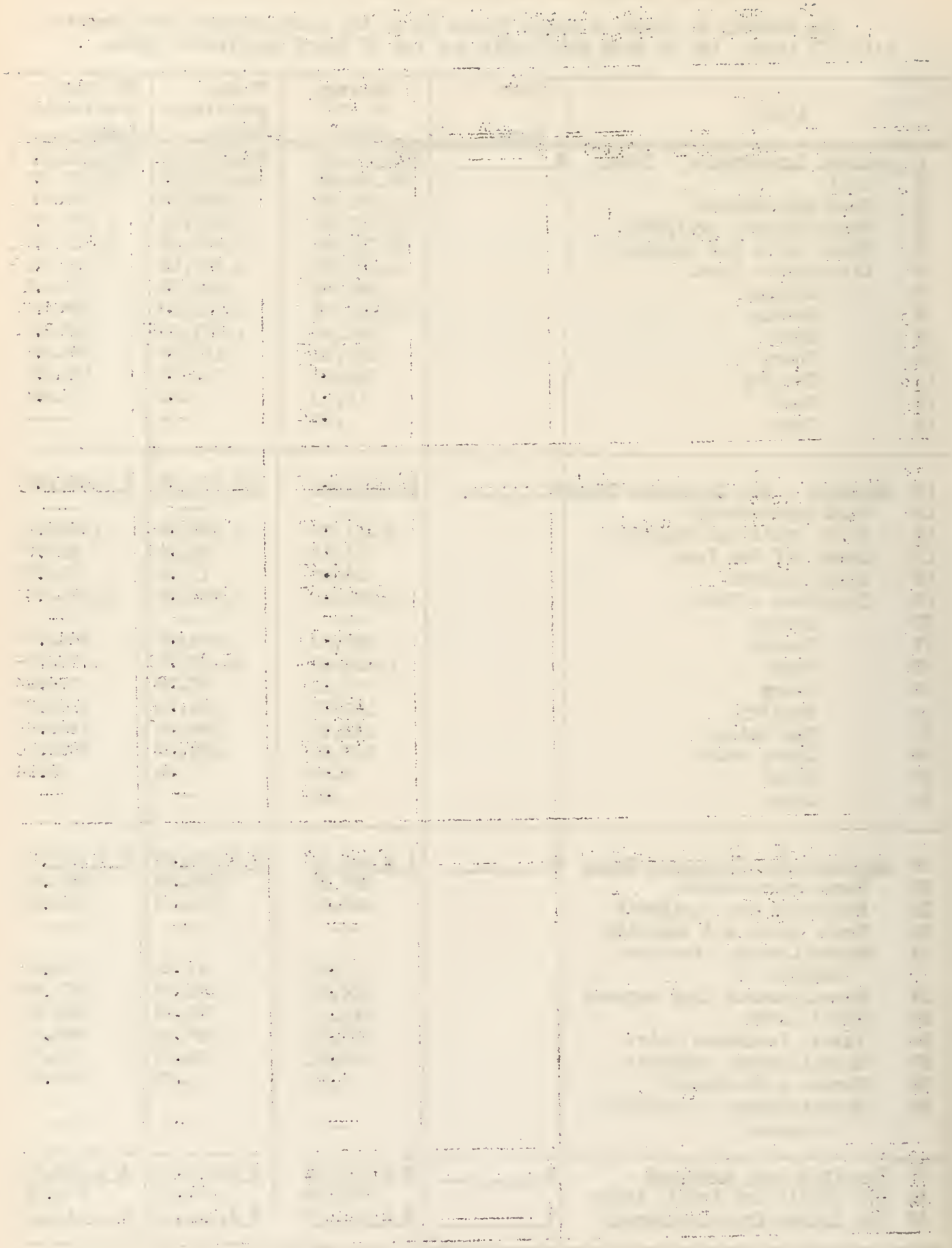


Table 2 - IMPORTANT FACTORS BY WHICH THE FARM BUSINESS MAY BE STUDIED
Underlined factors are the ones used on the chart, Page 9

Item	Your farm	Average of 175 farms	35 most profitable farms	35 least profitable farms
Rate earned on investment	%	3.34%	5.83%	0.93%
Labor and management wage	$	$-296.39	$1,268.39	$-1,531.11
Gross receipts per acre		22.36	28.75	16.98
Total expense per acre		13.68	13.65	14.60
Net receipts per acre		8.68	15.10	2.38
Size of farm		232.3	246.2	214.2
Total investments per acre	$	$ 259.99	$ 258.75	$ 256.33
Land		195.12	196.38	190.80
Farm improvements		24.41	21.38	25.81
Machinery and equipment		8.19	7.42	8.92
Feed, grain and supplies		18.14	19.04	17.35
Horses		3.63	3.26	3.58
Productive livestock		10.50	11.27	9.87
Corn - Bushels per acre		49.7	53.9	45.2
Oats - Bushels per acre		37.4	41.4	35.6
Wheat - Bushels per acre		19.7	23.0	18.5
Crop Index		100.0	110.0	92.7
Percent of farm tillable		91.3	91.8	91.4
Percent of tillable land in H. profit plus one-half M.profit		64.3	67.9	60.2
Higher profit crops		59.9	63.0	57.4
Corn		45.0	45.9	43.6
Wheat		6.2	9.4	4.3
Alfalfa		2.4	2.1	2.7
Sweet clover		5.2	4.9	6.1
Canning and truck crops		1.1	.7	.7
Medium profit crops		8.7	9.8	5.7
Clover		3.0	2.4	2.7
Clover and timothy mixed		2.7	2.8	.9
Barley		1.1	2.2	.9
Soybeans		1.2	1.6	.7
Miscellaneous		.7	.8	.5
Low profit crops		31.4	27.2	36.9
Oats		25.3	22.4	27.5
Timothy		1.9	1.7	2.8
Bluegrass		4.2	3.1	6.6
All legumes		14.8	14.0	13.3
All grain and hay crops		88.0	89.9	85.1

Table 2 - (Continued)

Item	Your farm	Average of 175 farms	35 most profitable farms	35 least profitable farms
Productive livestock				
Average investment per acre	$	$ 9.90	$ 12.75	$ 8.94
Total returns per acre		13.68	21.69	10.51
Feed used per acre		9.04	13.27	7.77
Feed to all productive livestock	$	$1,982.90	$2,951.85	$1,716.96
Beef cattle		1,459.59	1,233.76	1,267.36
Mixed cattle		827.03	864.22	686.34
Dairy cattle		576.53	546.84	497.86
Hogs		1,173.08	1,832.79	1,124.59
Sheep		311.97	326.31	410.70
Poultry		157.20	161.82	154.55
Returns per $100 feed fed to all productive livestock	$	$ 151.41	$ 163.44	$ 135.34
Beef cattle		99.02	114.57	82.68
Mixed cattle		117.78	135.98	119.58
Dairy cattle		143.65	175.30	115.06
Hogs		163.20	167.73	152.70
Sheep		93.63	125.87	67.45
Poultry		269.61	303.64	238.42
Returns per $100 invested in all productive livestock	$	$ 132.65	$ 166.33	$ 116.69
Beef cattle		83.94	115.86	73.38
Mixed cattle		88.98	103.92	95.69
Dairy cattle		121.78	149.72	96.74
Hogs		181.49	205.38	161.75
Sheep		41.35	43.39	32.67
Poultry		212.61	242.14	214.75
Pounds of pork produced - total		16,861	28,721	12,552
Pounds of pork produced per acre		73.1	116.7	59.4
Feed cost per 100 pounds of pork	$	$ 6.53	$ 6.49	$ 6.82
Returns per 100 pounds of pork	$	$ 10.66	$ 10.88	$ 10.42
Average number of hens kept		117.7	133.3	135.0
Number of eggs per hen		84.9	94.6	81.5
Amount and price of products sold				
Bushels of corn		2,607	2,598	2,231
Bushels of oats		1,198	1,289	1,103
Bushels of wheat		247	419	156
Pounds of pork		15,910	27,955	11,821
Average price received for corn	$	$ .76	$ .81	$ .73
Average price received for oats		.40	.40	.38
Average price received for wheat		1.32	1.34	1.24
Average price received for hogs		11.05	11.15	11.02
Percent of average price received for all		100.0	102.8	97.2

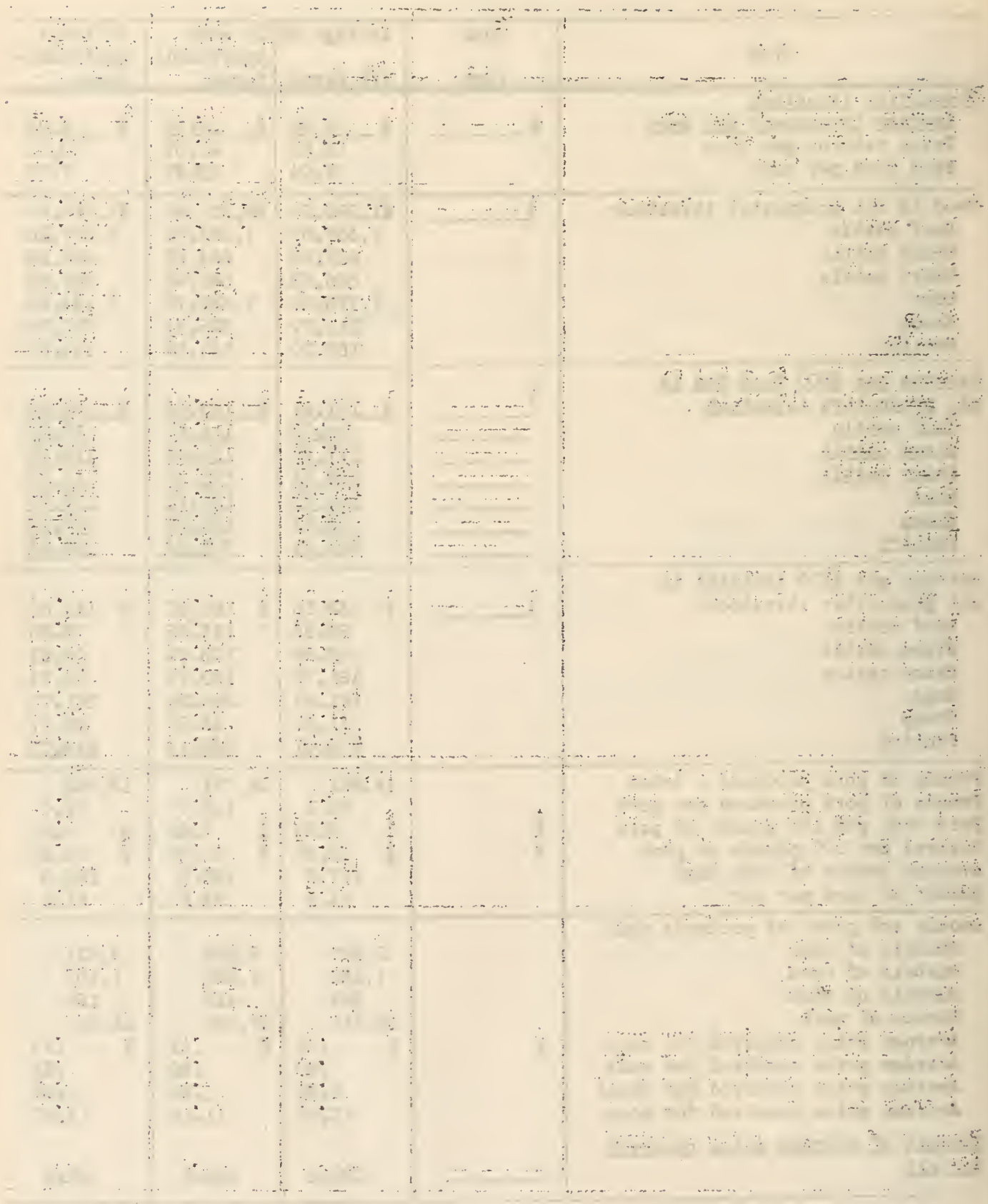


Table 2 - (Concluded)

Item	Your farm	Average of 175 farms	35 most profitable farms	35 least profitable farms
Labor, Power and Machinery Studies				
Percent of farm years with tractors		70.7	82.9	65.7
Percent of farm years with trucks		17.3	17.1	22.9
Percent of years with tractors and trucks		15.0	17.1	15.2
Percent of years without tractors or trucks		26.3	17.1	24.8
Average acres in crops		126.8	203.2	166.6
Average number of men		2.01	2.10	1.92
Crop acres per man		92.8	96.9	86.9
Labor cost per acre of crop	$	$ 8.36	$ 8.18	$ 8.97
Percent of average crop acres worked with given labor cost	_____	100.0	112.5	89.2
Average number of workable horses		7.62	7.31	7.23
Crop acres per horse		24.6	27.8	23.1
Value of feed fed to horses	$	$566.46	$554.00	$533.94
Feed cost per workable horse		74.29	75.77	73.87
Horse feed and depreciation per crop acre		3.06	2.74	3.35
Machinery cost per crop acre		2.59	2.45	3.30
Horse and mach'y cost per crop acre		5.65	5.19	6.65
Percent of average crop acres worked with given horse and machinery cost	_____	100.0	117.7	83.0
Expense per $100 gross income	$_____	$ 63.04	$ 48.99	$ 86.49
Expenses per acre of farm		13.68	13.65	14.60
Farm improvements		1.11	1.00	1.25
Horses		.02	.01	.11
Machinery and equipment		2.12	2.04	2.55
Feed, grain and supplies		----	----	----
Miscellaneous livestock expense		.22	.27	.20
Miscellaneous crop expense		1.10	1.23	1.09
Hired and home labor		6.72	6.75	6.98
Taxes, insurance, etc.		2.18	2.14	2.19
Miscellaneous		.21	.21	.23
Family living furnished by farm				
Farm produce used in home	$	$437.73	$402.11	$459.45
House rent (10% of value)		483.86	460.38	459.46
Total living furnished by farm		921.59	862.49	918.91
Number in family		4.80	4.70	4.78

Table 3.-Find Your Farm Leaks

The number in each column above the double line across the middle of the page is the average for the 175 farms for the factor named at the top of that column. The number in each column above the upper single line is approximately the average for the one-fifth of the farms which are best in that factor. By drawing a line across each column at the number measuring the efficiency of your farm as shown in Table 2, you can compare your efficiency with that of the other farms.

	1				2	3							4	5	6					7	
Rate earned on investment	Bushels per acre			% of ave. yield of all crops	% land in high profit crops	Livestock return per $100 feed					Feed used per acre	Size of farm	% crop acres for average		Price received for products				% ave. price all products	Expense per $100 gross income	Gross income per acre
	Corn	Oats	Wh't			Cattle	Hogs	Sheep	Hens[1]	All L.S.			labor cost	power and machinery cost	Corn	Oats	Wheat	Hogs			
8.9	73.5	63.3	33.0	149	92		289	332	444	256	30	554	170	191	1.04	.54	1.95	13.50	121	27	44
8.1	70.1	59.6	31.1	142	88		271	298	411	241	27	508	160	178	1.00	.52	1.86	13.15	118	32	41
7.3	66.7	55.9	29.2	135	84		253	264	378	226	24	462	150	165	.96	.50	1.77	12.80	115	37	38
6.5	63.3	52.2	27.3	128	80		235	230	345	211	21	416	140	152	.92	.48	1.68	12.45	112	42	35
5.7	59.9	48.5	25.4	121	76		217	196	312	196	18	370	130	139	.88	.46	1.59	12.10	109	47	32
4.9	56.5	44.8	23.5	114	72		199	162	279	181	15	324	120	126	.84	.44	1.50	11.75	106	52	29
4.1	53.1	41.1	21.6	107	68		181	128	246	166	12	278	110	113	.80	.42	1.41	11.40	103	57	26
3.3	49.7	37.4	19.7	100	64		163	94	213	151	9	232	100	100	.76	.40	1.32	11.05	100	62	23
2.5	46.3	33.7	17.8	93	60		145	60	180	136	6	186	90	87	.72	.38	1.23	10.70	97	67	20
1.7	42.9	30.0	15.9	86	56		127	26	147	121	3	140	80	74	.68	.36	1.14	10.35	94	72	17
.9	39.5	26.3	14.0	79	52		109	- 8	114	106	0	94	70	61	.64	.34	1.05	10.00	91	77	14
.1	36.1	22.6	12.1	72	48		91	-42	81	91	-	48	60	48	.60	.32	.96	9.65	88	82	11
-.7	32.7	18.9	10.2	65	44		73	-76	48	76	-	2	50	35	.56	.30	.87	9.30	85	87	8

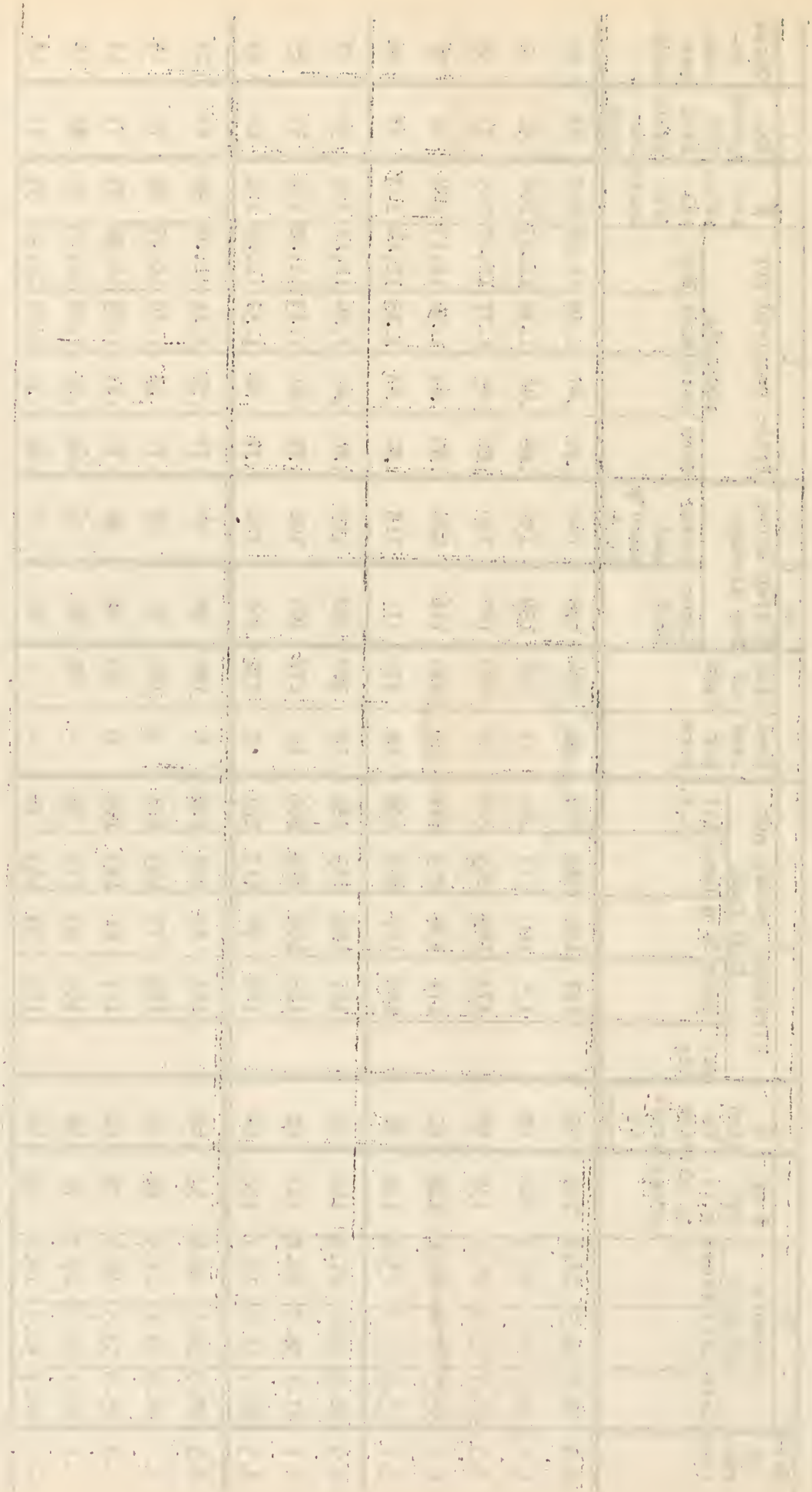
[1]Returns per $100 average investment used for poultry.

Table 3. [illegible]

in each column above the do[illegible] the middle of the page is the average for the 175 farms for [illegible] named at the top of that colum[illegible] number in each column above the upper single line is the average [illegible] e-fifth of the farms which are best in that factor. By drawing a line across each column at the number measuring the efficiency of your farm as shown in Table 2, you can compare your efficiency with that of the other farms.

Rate on capital	1 Bushels per acre			% of ave. y'ld of all crops	2 % land in high profit crops	3 Livestock return per $100 feed					Feed used per acre	Size of farm	4 % crop acres for average		5 Price received for products				% ave. price all products	6 Expense per $100 gross income	7 Gross income per acre
	Corn	Oats	Wheat			Cattle	Hogs	Sh'p	Hens[1]	All L.S.			labor cost	power and mach'y cost	Corn	Oats	Wh't	Hogs			
[illegible]	59.5	46.5	27.4	149	92		177	171	283	256	30	554	128	142	.90	.47	1.39	11.26	107	27	37
8.9	[illegible]	[illegible]	26.3	142	88		175	160	273	241	[illegible]	[illegible]	124	136	.88	.46	1.38	11.23	106	32	[illegible]
8.1	70.[illegible]	[illegible]	[illegible].2	135	84		173	149	263	226	[illegible]	[illegible]	120	130	.86	.45	1.37	11.20	105	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible].1	128	80		171	138	253	211	21	416	116	124	.84	.44	1.36	11.17	104	42	31
5.7	53.9	41.3	23.0	121	76		169	127	243	196	18	370	112	118	.82	.43	1.35	11.14	103	47	29
4.9	52.5	40.0	21.9	114	72		167	116	233	181	15	324	108	112	.80	.42	1.34	11.11	102	52	27
4.1	51.1	38.7	20.8	107	68		165	105	223	166	12	278	104	106	.78	.41	1.33	11.08	101	57	25
3.3	49.7	37.4	19.7	100	64		163	94	213	151	9	232	100	100	.76	.40	1.32	11.05	100	62	23
2.5	48.3	36.1	18.6	93	60		161	83	203	136	6	186	96	94	.74	.39	1.31	11.02	99	67	21
1.7	46.9	34.8	17.5	86	56		159	72	193	121	3	140	92	88	.72	.38	1.30	10.99	98	72	19
.9	45.5	33.5	16.4	79	52		157	61	183	106	0	94	88	82	.70	.37	1.29	10.96	97	77	17
.1	44.1	32.2	15.3	72	48		155	50	173	91	-	48	84	76	.68	.36	1.28	10.93	96	82	15
-.7	42.7	30.9	14.2	65	44		153	39	163	76	-	2	80	70	.66	.35	1.27	10.90	95	87	13

[1]Returns per $100 average investment used for poultry.



Profitable Farming Requires Balanced Farming

Weaknesses in some parts of the farm business often offset the advantages gained at other points. Records from hundreds of farms kept during the past twelve years together with other studies show that among the factors which affect farm earnings each of the following has its place:

1. Crop yields
2. Kind of crops grown
3. Livestock efficiency
4. Use of man labor
5. Use of power and machinery
6. Relation of expenses to receipts
7. Production in accord with market demands as shown by prices
8. Amount of livestock
9. Volume of business
10. Diversification of crops
11. Arrangement of fields and farmstead

In Chart 2 is shown the value of doing at least fairly well along the line of each of the first seven factors named above. The 175 farms were divided into eight groups according to the number of those seven factors in which each farm did more efficient work than the average of all the farms studied.

Chart 2 - Relation of Rate Earned on the Total Farm Investment to the Number of Factors in Which Farms Excel. Average of Three Years' Records.

Number of factors in which farms excel	Number of farms	Your farm	The lengths of the shaded lines are in proportion to the average rates earned on the total farm investments.	Rate earned	Average net income
7	6		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	6.7	$4,020
6	9		XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.8	2,880
5	43		XXXXXXXXXXXXXXXXXXXXXXXXXXX	4.6	2,760
4	33		XXXXXXXXXXXXXXXXXXX	3.3	1,980
3	28		XXXXXXXXXXXXXXXXX	3.0	1,800
2	26		XXXXXXXXXXXXX	2.2	1,320
1	16		XXXXXXXXX	1.6	960
0	4		XXXXXXXXX	1.6	960

It may well be noted that as an average of three years those few farms which were doing better than the average along all seven lines of farm work earned 6.7 percent on their total farm investments, while those which were below the average in all factors earned only 1.6 percent. Applied to the average farm investment, this meant a difference of about $3,060. With considerable regularity, the rates earned on the eight groups of farms decreased as the number of factors in which the farms excelled decreased. Each of the above factors is discussed briefly on the following pages.

CROP YIELDS

Good crop yields are, as a general rule, essential for good net farm incomes. Chart 3 shows the relation found between the yields of corn, oats, wheat and barley on the farms of the cooperators and the rates earned on the total farm investments. It should be understood that not all of the indicated increase of net income on the farms having higher yields of grain is due to such increased yield. The tendency is for the same farms which have good grain yields to have good yields of hay and pasture crops, larger proportions of tillable land in the higher profit crops, and to have higher returns for feed fed to livestock.

Chart 3 - Rate Earned as Related to the Yield of Grain

The rates earned on the different groups of farms were affected more or less by other factors such as percent of land in higher profit crops and efficiency in feeding livestock. Yields of corn, oats, wheat and barley were considered in making this analysis.

Percent of average yield	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned on the total farm investments	Rate earned	Average net incomes
113.9-139.3 121.3 av.	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.5	$2,700
104.4-113.9 109.1 av.	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.8	2,280
96.6-104.3 100.5 av.	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXX	2.9	1,740
87.6-96.3 92.6 av.	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXX	2.9	1,740
67.8-87.6 80.8 av.	35		XXXXXXXXXXXXXXXXXXXXXXXX	2.5	1,500

It may well be noted that for the years 1925, 1926 and 1927 an increase of ten bushels per acre of corn was accompanied by an increase of about one percent in the rate earned on the investment. On the average farm this meant that with each ten bushels increase in yield of corn there was about $600 increase in the total net return for the farm.

What Cooperators Do To Secure Good Crop Yields

1. Use varieties and strains of corn, wheat, oats, etc., which long-time investigations of the experiment stations have proved to be high-yielding and adapted to the conditions.
2. Make germination tests of representative samples of all seeds.
3. Test for disease at least enough seed corn to plant a small field on which no corn had been grown for two or more years from which to select the next year's seed. Treat seed oats and wheat for smut each year.

Any tenant or landowner in difficult financial condition can do the above things almost as easily as the most prosperous landowner.

4. Use a cropping system which provides that each field is left in some deep-rooted legume at least once in four or five years.
5. Use a definite plan for the efficient use of all available manure.
6. Use limestone and rock phosphate on soil types where investigations show that they can be used profitably.

Value of Different Soil Treatments

Records were kept of the yields of crops on each field. The previous soil treatment of each field over ten acres in size was recorded each of the three years. In analyzing the data the only fields used were those on the common prairie soil classified as Brown Silt Loam and Black Clay Loam. Fields seriously damaged by insects or storms were not used. In Table 4 manure means that fields so treated had been covered with more or less manure during the four preceding years. It is estimated that, as an average, about five to six tons of manure was applied. Clover means that such fields had been left down in a good or poor stand of red, alsike, mammoth, or sweet clover or alfalfa during one or more of the preceding four years. Phosphate means that at some time the entire field had been covered with more or less raw rock phosphate. The amounts varied from one thousand to four thousand pounds per acre with an average of about fifteen to eighteen hundred pounds. Much of the phosphate had been applied in 1912 to 1916 and some only the previous year. No other forms of phosphate than the raw rock were used on the cooperating farms. It is not right to use such comparisons for limestone as are reported for phosphate, clover and manure. If this were done, comparisons would be made of yields on fields naturally rich in limestone where none had been applied but where clovers grow readily, with less fertile fields where limestone had been used. To a less extent than with limestone, this same difficulty applies to this analysis of the value of phosphate, clover and manure. However, any inaccuracies due to this situation do not exaggerate the value of each soil treatment but show it less than it really is.

Table 4 - Value of Different Soil Treatments

Averages of three years of 1925, 1926 and 1927

Soil Treatment	Your farm	CORN			OATS			WHEAT		
		ave. no. of fields per year	ave. acres per year	ave. bu. per acre	ave. no. of fields per year	ave. acres per year	ave. bu. per acre	ave. no. of fields per year	ave. acres per year	ave. bu. per acre
None		79	2421	43.0	78	2191	33.0	27	478	17.2
Manure only		34	812	46.8	28	637	37.1	6	132	19.4
Clover only		50	1275	49.7	24	590	34.2	7	170	18.3
Manure and clover		59	1363	53.6	21	442	43.1	7	122	24.5
Manure and phosphate		7	166	50.7	6	132	43.1	2	29	22.0
Clover and phosphate		25	589	55.4	9	197	45.1	2	38	27.4
Manure, clover and phosphate		25	550	59.1	11	284	50.6	3	62	30.0

These results show that when manure as used in the four counties was applied once in five years it added about 3.8 bushels of corn, 6.2 bushels of oats and 3.7 bushels of wheat per acre. Clover left down one or more in each five years, added about 5.7 bushels of corn, 4.2 bushels of oats and 4.7 bushels of wheat per acre. Phosphate, used as indicated in this section, added about 5.0 bushels of corn, 7.8 bushels of oats and 5.4 bushels of wheat per acre. Considerable of the increase for clover could logically be credited to limestone because without the use of limestone, the successful growing of clover would not have been possible. These results certainly justify soil improvement programs even at considerable expense for limestone clover seed and rock phosphate.

Value of High Yielding Varieties of Grain

Co-operators will remember that each year a record was made of the kind of seed used on each field of corn, oats and wheat. In summarizing the data regarding crop yields the only fields used were those on prairie land, (brown silt and black clay loam), of ten acres or larger size and undamaged by serious insect or storm injuries. In most, if not all, cases the same varieties and soil treatments which proved best on prairie land, also proved best on other types of soil. In analyzing the data regarding yields of different varieties, strains and types of grain, the fields were divided into three groups according to the soil treatments which the fields had had.

Fields recorded as having had good soil treatments were those which had had phosphate applied at some time and had been covered with more or less manure or had been left in some deep rooted legume during the previous four years, also fields which had been left in some legume and also had been covered with manure but had had little or no phosphate applied were classed as having had good soil treatment.

Fields recorded as having fair soil treatments were those which had had clover or manure or phosphate, but none in combination with the others.

Fields recorded as having little or no soil treatments were those which had had little or no clover manure or phosphate either by itself or in combination with other treatments.

Table 5.-Yields of Different Varieties and Strains of Corn
Averages for three years of 1925, 1926 and 1927

Strain or type	Your farm	Good soil treatment			Fair soil treatment			Little or no soil treatment			All soil treatments		
		Ave. no. of fields	Ave. acres per year	Ave. bu. per acre	Ave. no. of fields	Ave. acres per year	Ave. bu. per acre	Ave. no. of fields	Ave. acres per year	Ave. bu. per acre	Ave. no. of fields	Ave. acres per year	Ave. bu. per acre
Krug		68	1760	58.5	67	1764	53.4	40	1059	47.1	176	4582	54.0
All others		122	2947	53.4	196	5661	49.6	128	3864	43.6	446	12472	48.6
All utility		121	3009	57.2	148	4077	52.1	85	2303	45.9	354	9389	52.0
All old type		33	790	50.8	56	1559	48.1	46	1482	43.2	135	3830	46.7
Mixed		36	909	51.1	60	1789	48.4	38	1138	43.2	133	3836	47.5
All varieties		190	4708	55.1	264	7425	50.3	169	4923	44.4	622	17055	49.9

Table 6.-Yields of Different Varieties of Oats
Averages for three years of 1925, 1926 and 1927

Strain or type	Your farm	Good soil treatment			Fair soil treatment			Little or no soil treatment			All soil treatments		
		Ave. no. of fields	Ave. acres per year	Ave. bu. per acre	Ave. no. of fields	Ave. acres per year	Ave. bu. per acre	Ave. no. of fields	Ave. acres per year	Ave. bu. per acre	Ave. no. of fields	Ave. acres per year	Ave. bu. per acre
Iowar		20	510	49.1	40	1001	41.6	45	1178	37.7	105	2689	41.2
Iowa 103		19	424	46.0	25	638	38.6	22	607	37.7	66	1669	40.5
Great American		6	177	40.4	7	197	35.9	5	92	35.4	18	466	37.3
Big 4		4	103	48.9	14	350	37.3	15	444	32.7	33	897	36.1
Silvermine		8	196	40.2	14	379	33.7	16	452	29.2	38	1027	33.0
All early(1)		43	1006	47.6	72	1798	40.1	75	2042	37.3	190	4846	40.6
All late		27	684	41.2	63	1650	35.9	62	1738	31.2	152	4072	34.3
Mixed		1	14	40.1	2	49	36.8	3	192	29.8	6	255	32.7
All varieties		71	1704	44.1	137	3497	38.0	140	3972	34.5	347	9173	37.8

(1) Iowar is classed as an early oat. It is about five days later than Iowa 103 and five days earlier than Silvermine.

Table 7.-Yields of Different Varieties of Wheat
Averages for three years of 1925, 1926 and 1927

Strain or type	Your farm	Good soil treatment			Fair soil treatment			Little or no soil treatment			All soil treatments		
		Ave. no. of fields	Ave. acres per year	Ave. bu. per acre	Ave. no. of fields	Ave. acres per year	Ave. bu. per acre	Ave. no. of fields	Ave. acres per year	Ave. bu. per acre	Ave. no. of fields	Ave. acres per year	Ave. bu. per acre
Turkey Red		12	253	25.9	24	634	20.8	23	613	17.8	59	1500	20.4
Other types		4	73	18.6	5	106	19.3	5	102	15.5	14	280	17.3
Mixed		-	-	-	2	34	20.1	1	16	22.6	3	51	22.2
All varieties		16	326	23.4	31	774	20.3	29	731	17.6	76	1831	19.8

Money Value of the Use of High-Yielding Varieties

The farms which used Krug corn produced 5.4 bushels per acre or a total of 516 bushels more corn per farm per year than the average of all other farms. At the average sale price of 76 cents per bushel this increase was worth $392.16. Those farms which used Iowar oats produced 4.8 bushels more per acre or a total of 251 bushels more than those using other varieties. At the average price of 40 cents per bushel this meant an increase of $100.40. Turkey Red types of wheat outyielded all other types by 3 bushels. Those farms using the Turkey Red wheats produced an average of 39.6 bushels worth $52.27 more than those farms using other varieties.

Considering all crops, some cooperators have the opportunity of increasing their incomes by more than $500 per year merely by changing varieties of seed.

Value of Testing Seed Corn for Disease

The careful testing for disease of each ear of seed corn proved to be a profitable practice. The fields were divided into four groups according to the method of preparing the seed for planting as indicated in the following table. Disease tested seed included the first grade seed as tested in commercial testing laboratories at high schools, by farm bureaus and by individual farmers equipped to do careful work. Ear germination refers to the testing of each ear of seed for germination only. Most such seed was tested in rag dolls, water testers or by other methods where there was not opportunity to make careful selections of diseased ears. General germination refers to seed which was tested in a general way but each ear of which was not tested either for germination or disease.

Table 8.-Value of Testing Seed Corn for Diseases

How Tested	No. of fields per year	No. of acres per year	Percent of land	Average bushels per acre
Disease tested	144	3945	23.1	53.0
Ear germination	165	4172	24.5	51.4
General germination	175	5174	30.3	48.4
No test	48	1270	7.4	46.2
All fields	622	17055	100.0	49.9

It will be noted that as a three year average, nearly one-third of the corn land on these farms was planted with seed which had had only a general test. Such fields yielded 4.6 bushels per acre less than those planted with carefully disease tested seed and 3.0 bushels less than that ear tested for germination only. Even when tested in commercial laboratories, one bushel per acre increase will more than pay for the cost of testing. These records indicate that many cooperators have the opportunity to increase their annual net incomes by two hundred or more dollars merely by testing their seed corn for disease.

Value of Growing Profitable Kinds of Crops

It often happens that a farm which has good crop yields and where efficient work with livestock is done is relatively unprofitable because a large part of the tillable land is used in growing crops which do not give as good returns for the land, labor, power, and machinery as do other crops which might be grown.

Chart 4 shows the relation of the rates earned on these farms and the percent of tillable land in the combined acreage of the higher profit crops of corn, wheat, alfalfa, sweet clover and canning crops of sweet corn, peas, and pumpkin. The selection of corn and wheat as the higher profit grain crops, of alfalfa as the higher profit hay crop, and of sweet clover as the higher profit pasture crop for tillable land was based on long-time investigations of the Departments of Farm Organization and Management and Animal Husbandry of the University of Illinois.

Chart 4 - Rate Earned as Related to the Percent of Land in the Higher Profit Crops

It should be understood that part of the increased net income was due to better crop yields, better handled livestock, etc., on the same farms. Data show averages of 1925, 1926 and 1927 records.

Percent land in higher profit crops	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned on the total farm investments	Rate earned	Average net income
76.7 ave. 71.3-85.5	35		XXXX

Relation of Amount and Efficiency of Livestock to Farm Incomes

Efficient care and feeding of livestock is essential for the best net farm incomes. Those farms having a small amount of livestock well handled had larger net incomes than farms having large amounts of livestock poorly handled. With the favorable prices of livestock in relation to prices of grain during 1925, 1926 and 1927 the farms which fed most of their grain to well handled livestock had net incomes nearly $2,000 higher than farms having small amounts of livestock poorly handled.

Chart 5 - Relation of the Rate Earned and the Amount and Efficiency of Livestock

It should be understood that the rates earned were affected also by the crop yields, percent of land in higher profit crops, etc.,- averages of 1925, 1926 and 1927 data.

Returns for $100 feed	No. of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned by the different groups of farms	Rate earned	Average net income
Most Livestock - $16.61 of feed per acre $ 12.97 to $ 32.96					
$162 Aver. 149.03-187.64	16		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	5.6	$3,360
$143 Aver. 137.40-148.97	16		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.0	2,400
$125 Aver. 90.91-135.92	16		XXXXXXXXXXXXXXXXXXX	2.5	1,500
Medium Livestock - $8.59 of feed per acre $ 6.74 to $ 10.77					
$183 Aver. 168.21-206.01	16		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4.3	2,580
$158 Aver. 148.37-166.85	16		XXXXXXXXXXXXXXXXXXXXXXXXXX	3.5	2,100
$127 Aver. 88.81-148.34	16		XXXXXXXXXXXXXXXX	2.2	1,320
Least Livestock - $4.66 of feed per acre $ 1.52 to $ 6.74					
$190 Aver. 178.91-211.77	16		XXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.7	2,220
$157 Aver. 149.70-168.56	16		XXXXXXXXXXXXXXXXXXXXXXXX	3.2	1,920
$133 Aver. 75.11-148.35	16		XXXXXXXXXXXXXXXXXXX	2.5	1,500

Those farms in the first three groups which fed an average of $16.61 worth of feed per acre fed a large portion of their crops while those in the last three groups which fed an average of only $4.66 worth of feed per acre sold most of their grain.

A few of the more important things the cooperators do to get high returns for feed fed to livestock are:

1. Use the best types of breeding stock.
2. Study market conditions carefully as a guide to the purchase and sale of cattle, sheep and hogs.
3. Follow proved plans for keeping livestock healthy, such as the McLean County System of Swine Sanitation and the growing of chicks on clean ground.
4. Use rotated legume pastures which provide clean feeding grounds and the necessary protein and minerals in the rations.
5. Grow their own feeds, especially legumes, for the proper feeding of the livestock.
6. Purchase sufficient unmixed high protein products, such as tankage, oil meal, and cottonseed meal to balance the home-grown feeds.

Efficiency in the Use of Man Labor

On several farms, high labor costs was one of the most important factors responsible for low net farm incomes. Usually efficient use of farm power including both horses and mechanical power goes with efficient use of man labor. Hence a part of the difference in net farm incomes between the farms making the best use and the poorest use of man labor may be attributed to the good use of power and equipment. These items are of such importance that careful attention needs to be given to them in the operation of the farm.

Chart 6 - Efficiency in the Use of Man Labor

Percent of average crop acres for average cost	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned on the total farm investment.	Rate earned	Net farm income
130.8 Aver. 118.9-169.4	31		XXXX

Efficiency in the Use of Horse Power and Machinery

The cost of horse and mechanical power and machinery is frequently misjudged. Farms are frequently found where these costs are the most important single items in keeping down the farm earnings. The cost of mechanical equipment is not fully realized until it must be replaced, while the cost of horse power may seem small, because the feed horses eat is raised on the farm and its value is seldom determined or appreciated.

Chart 7.--Power and Machinery Cost as Related to Earnings on Total Farm

Percent of average crop acres for average cost	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned in the total farm investment.	Rate earned	Net farm income
139.5 Aver. 124.5-226.8	30		XXXX

Influence of Prices on Farm Earnings

The differences in the prices farmers receive for their products in the same community and in the same years accounts for some difference in farm earnings. Many people, however, are inclined to attribute too much importance to this factor in explaining the differences in the farm earnings.

Chart 7 shows the relation between the prices received for corn, oats, wheat and hogs and the rates earned on the total farm investments. Not all of the increased net income on the farms receiving the better prices can be attributed to the higher price received for these products. The higher prices received were due in part to the better grade of products sold. And, as in the case of corn, the corn that comes from good land and yields best usually grades best and sells a little higher on the market. Hence yield and other factors are in part responsible for the differences in farm earnings shown in the following chart.

Chart 7.- Rate Earned as Related to the Prices Received for Farm Products

Percent of average price	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned on the total investments	Rate earned	Net farm income
108.4 Aver. 105.1-118.5	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.9	$2340
102.9 Aver. 100.8-105.1	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.7	2220
99.2 Aver. 97.9-100.7	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.6	2160
96.5 Aver. 94.7-97.8	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.0	1800
90.7 Aver. 85.1-94.6	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	2.4	1440

The years 1926 and 1927 were both years when the quality of crops was damaged by weather conditions. In 1926 the wet weather seriously damaged small grain and delayed corn husking which resulted in damaged corn especially where it was down. In 1927 the early frost was the cause of much low-grade corn. It is probable that during this period the fluctuation in farm prices and damages from climatic conditions were greater than normal, and that the price received for products sold had fully as much influence on earnings relative to other factors as is likely to be true over a period of years.

What Some Cooperators Do to Secure Better Prices

1. Use varieties of crops that mature in good season, that is, small grain that resists hot weather or matures before hot weather, or corn that matures before frost.
2. Provide a fertile soil that produces a good quality of grain.
3. Plant crops at the right time.
4. Keep crops free from disease as a means of improving quality.
5. Protect crops from damage after harvesting, especially corn which is frequently cribbed in poor condition and in poorly ventilated cribs.
6. Finish hogs and other livestock at the time good prices are to be expected.

Thrift - The Keeping of Expenses Low in Proportion to Receipts

Some farms which produced good crop yields had a large proportion of the land in higher profit crops and made a good return for the feed fed to livestock, and had low net incomes because the expenses were high in proportion to the income.

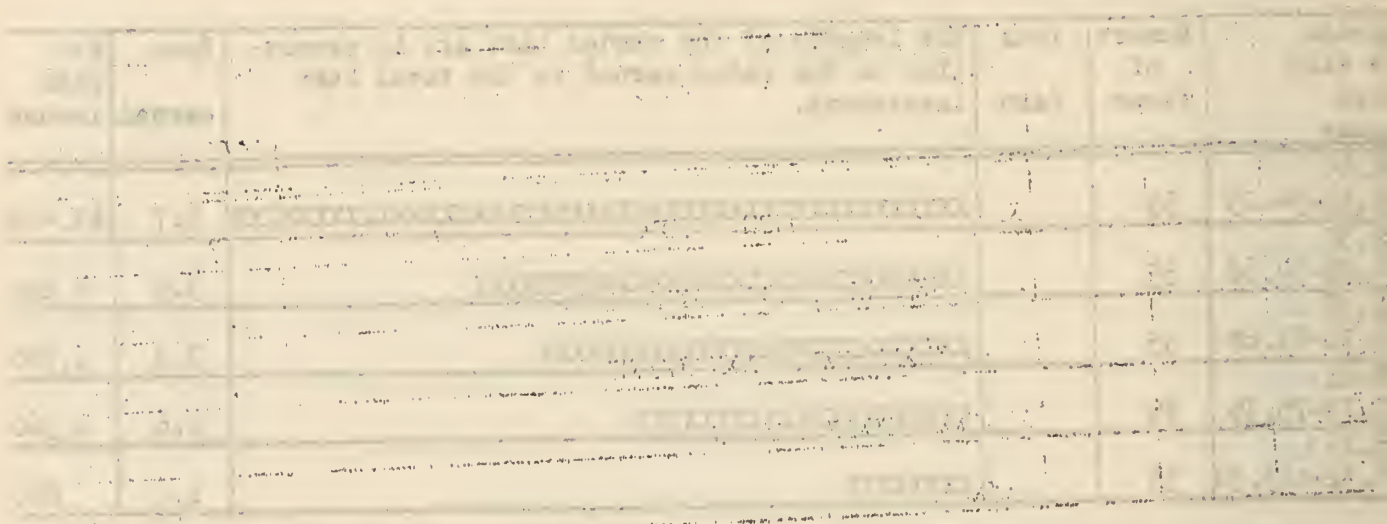
In Chart 9 the farms are grouped according to the total expense including the operator's and family labor for each $100 of gross income. As was to be expected, there was a regular decrease in the rate earned on the investment as the expenses in proportion to receipts increased.

Chart 9 - Rate Earned in Relation to the Proportion of Expenses to Receipts Averages of 1925, 1926 and 1927 Data

Expense for $100 gross income	Number of farms	Your farm	The lengths of the shaded bars are in proportion to the rates earned in the total farm investment.	Rate earned	Net farm income
$48.05 Aver. $39.59-54.23	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	5.7	$3,420
$57.30 Aver. $54.26-59.68	35		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3.8	2,280
$61.36 Aver. $59.70-63.68	35		XXXXXXXXXXXXXXXXXXXXXXXXXX	3.3	1,980
$68.21 Aver $63.72-75.35	35		XXXXXXXXXXXXXXXXXXXX	2.6	1,560
$86.16 Aver $76.32-113.32	35		XXXXXXXX	1.0	600

What Cooperators Do to Keep Expenses Low in Proportion to Receipts

1. Select and prepare most of the seed used, buying a little improved seed occasionally as more valuable strains are discovered or developed.
2. Repair machinery, harness, fences, and buildings with the farm labor.
3. Grow enough crops high in protein and minerals, such as alfalfa, sweet clover, and soybeans, to balance the grain ration, saving much of the purchase price of expensive protein supplements.
4. Use home-grown feeds as far as possible.
5. Plan work so as to make as few trips to town as possible, thus saving time and gas.
6. Feed work horses in accordance with the work done. On some farms much feed goes to idle horses which could more profitably go to cattle or hogs or be sold.
7. Purchase inexpensive but serviceable equipment. As an illustration many cooperators are building individual hog houses costing about $10 each which are as useful and will last as long as other houses costing three times as much.



ORGANIZATION AND PURPOSE OF THE FARM BUREAU-FARM MANAGEMENT SERVICE

The Farm Bureau-Farm Management Service Project was organized during the latter part of the year 1924. Its purpose is to assist the farmers cooperating in it to keep such farm accounts as will enable them to study the efficiency with which they are conducting their farm business and to help them to apply to their individual farms the practices in farm organization and operation which have proved profitable on other farms of a similar type. The cooperators in the project are farm bureau members of Livingston, McLean, Tazewell, and Woodford counties. The project is an outgrowth of the regular farm management extension work. The extension work in Farm Management was begun in Tazewell county in 1915 and some work was done in all of the four counties in 1916.

In Woodford county from 30 to 100 farmers completed farm accounts from 1916 to 1921 and beginning in 1921 over 100 records have been closed each year. Farm management tours have played an important part in developing interest in the work. The growing number of farmers keeping records made it impossible for the College of Agriculture to give as much assistance through the regular extension work as was desired by the farmers cooperating in the extension project. This was the situation that led to the organization of the Farm Bureau-Farm Management Service.

About sixty farm bureau members in each of the four counties agreed to cooperate in the project for the three years of 1925, 1926 and 1927. The total average cost is about thirty dollars per farm per year. About 40 percent of the expense is borne by the University of Illinois. This leaves a cost per farm of about seventeen dollars per year. The fee per farm varies from ten to twenty dollars per year, depending on the size of the farm. In two of the counties the farm bureaus pay a portion of each fee, while in two counties the cooperators pay the entire fee of ten to twenty dollars.

The entire time of M. L. Mosher, one of the authors of this report, is given to the project. Each cooperator is being visited on his farm at least three times during each year. The work is under the direction of H. C. M. Case, in charge of the Department of Farm Organization and Management acting in cooperation with an advisory committee consisting of one representative of each farm bureau. This committee consists of G. F. Bennett, Livingston County, Chairman, E. D. Lawrence, McLean County, W. C. Somer, Tazewell County, and J. Frank Felter, Woodford County, who is secretary-treasurer. This committee is responsible to the cooperating farm bureau for the custody and expenditure of the funds raised by the collection of the cooperators' fees. Each Farm Bureau collects the fees from its cooperating members and pays them over to the committee.

The organization of the project was made possible by the hearty support and assistance of the four Farm Advisers and their assistants. The Farm Advisers who were in charge of their counties when the work was organized are H. O. Allison, Livingston County, H. Fahrnkopf, McLean County, Ralph E. Arnett, Tazewell County, and P. E. Johnston, Woodford County. Mr. Johnston left the county in January 1925 to specialize in Farm Management and H. A. deWerff, the present Farm Adviser, has cooperated since the work was started.

Most of the cooperators are continuing the work during 1928. Plans are now under way for reorganizing the project during the fall of 1928 for another period of years.

SUPPLEMENTAL SUMMARY REPORT

Of Farms Operated by Tenants Who Have Cooperated in the
Farm Bureau-Farm Management Service
For the three-year period of 1925, 1926, and 1927

Prepared by M. L. Mosher and H. C. M. Case

This supplemental report has been prepared for the benefit of the tenant cooperators who have shown in their records the division of receipts and expenses between the tenant and the landlord.

Differences in Tenants' Incomes

It will be noted (see Table 2) that, as an average, the ten most successful of the fifty tenants whose records were used in this report received a labor and management wage of $2,140 per farm per year for the three-year period. The ten least profitable tenant farms returned the operators an average of only $129 per farm per year for labor and management. The tenant's labor and management wage is what there is left after deducting from his total receipts all cash operating expenses, depreciation on his equipment, an allowance for family labor other than the operator's, and five percent interest on his investment in equipment, livestock and grain on hand at the beginning of the year.

It will be seen that one-fifth of the tenants made their business pay them a labor and management wage of about $2,000 per farm per year more than was received by another one-fifth of them.

There was a difference in the landlord's net income of 59 percent on the landlord's investment, in favor of the farms operated by the more successful tenants. This difference in rate applied to the average landlord's investment would amount to about $280.

Location of Differences in Tenants' Incomes

A careful comparison of the data shown in Table 2 of this report with that in Table 2 of the complete report, to which this is a supplement, will show that, in general, the same statements which were made as regards the location of differences in the earnings of the whole farm business apply to the differences in the tenant's share of the income.

The difference in crop yields was less important in making the differences in tenant incomes than when the total farm income was studied. On the other hand, more of the difference in income was due to the differences in the amounts of livestock on the more profitable and the less profitable tenant farms.

These data indicate very clearly the value of a profitable cropping system, and the value of livestock on the tenant farm.

Table 1.-SUMMARY OF THE THREE-YEARS' FARM BUSINESS

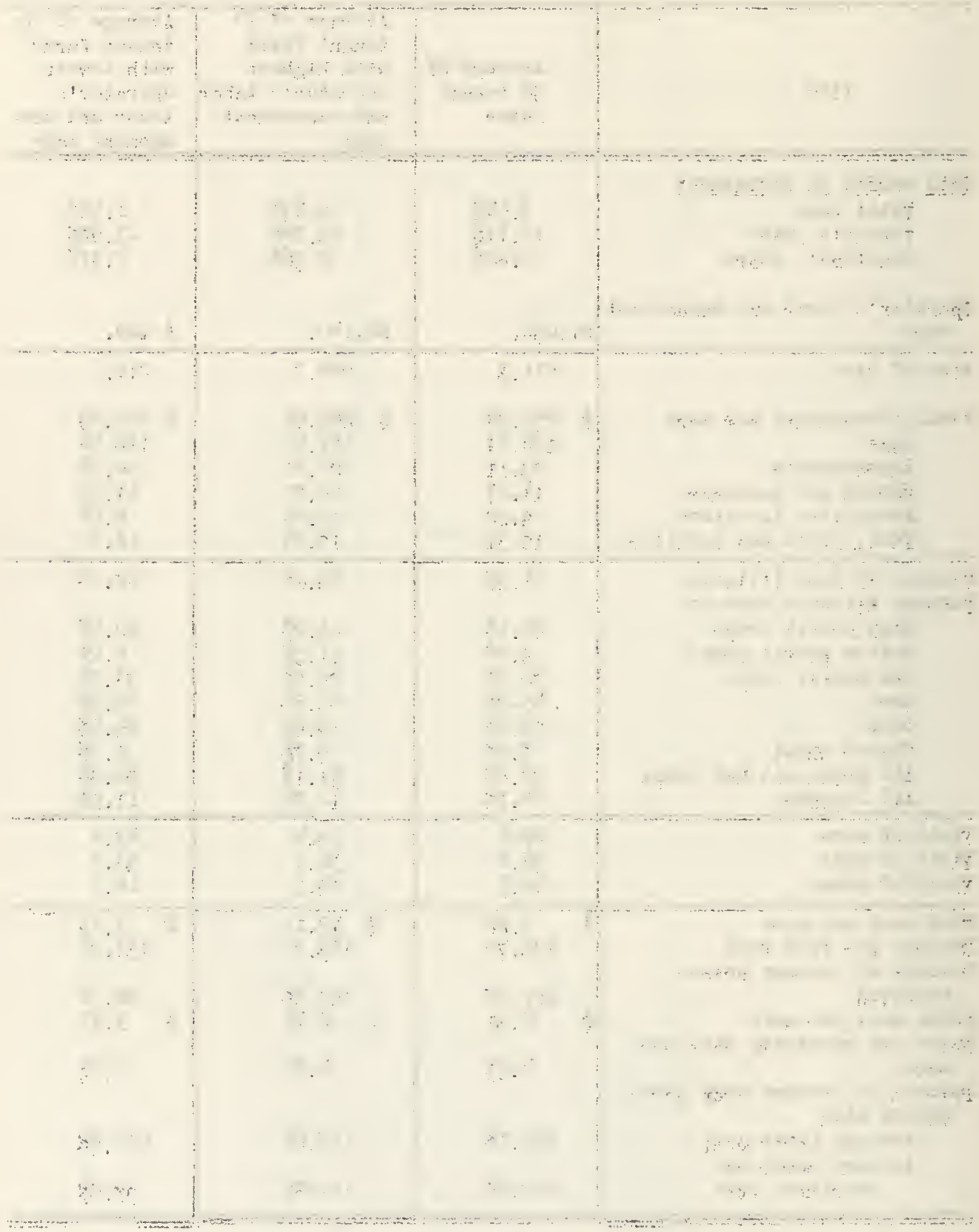
Items	Average of 50 tenant farms			Average of 10 tenant farms with highest operator's labor and management wage			Average of 10 tenant farms with lowest operator's labor and management wage		
	Whole farm business	Tenant's share	Landlord's share	Whole farm business	Tenant's share	Landlord's share	Whole farm business	Tenant's share	Landlord's share
Capital - Total	$54,109	$6,676	$47,433	$63,642	$7,577	$56,065	$50,806	$6,332	$44,474
Land	41,026	-	41,026	48,313	-	48,313	38,759	-	38,759
Farm improvements	4,884	193	4,691	5,450	47	5,403	4,402	123	4,279
Machinery and equipment	1,649	1,648	1	2,040	2,040	-	1,544	1,544	-
Feed, grain, supplies	3,868	2,323	1,545	4,661	2,584	2,077	3,933	2,497	1,436
Livestock - Total	2,682	2,512	170	3,178	2,906	272	2,168	2,168	-
Horses	734	726	8	622	622	-	778	778	-
Cattle	827	776	51	855	803	52	710	710	-
Hogs	865	758	107	1,369	1,169	200	526	526	-
Sheep	111	107	4	159	139	20	52	52	-
Poultry	143	143	-	173	173	-	102	102	-
Bees	2	2	-	-	-	-	-	-	-
Dogs	-	-	-	-	-	-	-	-	-
Receipts - Total	$ 4,798	$3,311	$1,912	$6,912	$5,042	$2,448	$3,463	$2,257	$1,658
Farm improvements	-	1	-	-	3	-	-	-	-
Feed, grain, supplies	1,931	723	1,347	1,868	606	1,503	1,679	473	1,354
Labor off the farm	45	45	-	78	78	-	25	25	-
Miscellaneous	14	14	-	15	15	-	12	12	-
Cash rent	-	-	285	-	-	334	-	-	304
Livestock - Total	2,808	2,528	280	4,951	4,340	611	1,747	1,747	-
Horses	16	16	-	13	13	-	26	26	-
Cattle	356	311	45	498	428	70	341	341	-
Hogs	1,760	1,547	213	3,373	2,878	495	1,029	1,029	-
Sheep	50	47	3	65	49	16	25	25	-
Poultry	115	115	-	147	147	-	68	68	-
Egg sales	143	143	-	230	230	-	77	77	-
Dairy sales	367	348	19	625	595	30	181	181	-
Bees	-	-	-	-	-	-	-	-	-
Dogs	1	1	-	-	-	-	-	-	-

Table 1.-SUMMARY OF THE THREE-YEARS' FARM BUSINESS (Continued)

Items	Average of 50 tenant farms			Average of 10 tenant farms with highest operator's labor and management wage			Average of 10 tenant farms with lowest operator's labor and management wage		
	Whole farm business	Tenant's share	Landlord's share	Whole farm business	Tenant's share	Landlord's share	Whole farm business	Tenant's share	Landlord's share
Expenses - Total	$2,081	$1,837	$ 669	$2,655	$2,443	$ 790	$1,890	$1,739	$ 603
Farm improvements	235	21	215	254	11	246	247	21	226
Machinery and equipment	445	445	-	501	501	-	432	432	-
Feed, grain, supplies	47	179	7	236	441	36	-	148	-
Misc. livestock expense	55	50	5	80	67	13	40	40	-
Misc. crop expense	242	196	46	256	201	55	219	192	27
Hired labor	534	528	6	768	748	20	483	483	-
Tax, insurance, etc.	442	53	389	467	48	419	402	52	350
Misc. expenses	43	42	1	49	48	1	39	39	-
Horses - decreases	36	36	-	39	39	-	28	28	-
Misc.livestock decreases	2	2	-	5	5	-	-	-	-
Cash rent	-	285	-	-	334	-	-	304	-
Receipts less expenses	$2,717	$1,474	$1,243	$4,256	$2,599	$1,658	$1,573	$ 518	$1,055
Op's and family labor	799	799	-	800	800	-	771	771	-
Net income from investment	1,918	675	1,243	3,456	1,799	1,658	802	-253	1,055

Table 2.-IMPORTANT FACTORS WHICH SHOW DIFFERENCES IN ORGANIZATION AND EFFICIENCY ON THE MORE SUCCESSFUL, AS COMPARED WITH THE LESS SUCCESSFUL TENANT FARMS

Item	Average of 50 tenant farms	Average of 10 tenant farms with highest operator's labor and management wage	Average of 10 tenant farms with lowest operator's labor and management wage
Rate earned on investment			
Total farm	3.54%	5.43%	1.58%
Tenant's share	10.11%	23.74%	-3.99%
Landlord's share	2.62%	2.96%	2.37%
Operator's labor and management wage	$1,054.	$2,140.	$ 129.
Size of farm	211.3	244.7	210.0
Total investments per acre	$ 256.08	$ 260.06	$ 241.89
Land	194.17	197.42	184.54
Improvements	23.11	22.27	20.96
Horses and machinery	11.27	10.88	11.05
Productive livestock	9.22	10.44	6.62
Feed, grain and supplies	18.31	19.05	18.72
Percent of farm tillable	91.5%	89.2%	88.0%
Percent tillable land in			
High profit crops	60.1%	63.0%	60.1%
Medium profit crops	9.0%	11.5%	6.2%
Low profit crops	30.9%	25.5%	33.7%
Corn	45.2%	46.5%	45.9%
Oats	24.6%	19.6%	29.6%
Winter wheat	7.0%	9.7%	5.7%
All grain and hay crops	88.4%	91.1%	90.4%
All legumes	14.7%	12.7%	11.9%
Yield of corn	48.6	50.4	43.4
Yield of oats	36.2	38.7	33.3
Yield of wheat	18.5	19.5	18.9
Feed used per acre	$ 9.28	$ 13.11	$ 7.03
Returns per $100 feed	155.70	163.70	137.26
Percent of average prices received	100.2%	102.4%	98.7%
Labor cost per acre	$ 6.31	$ 6.41	$ 5.97
Horse and machinery cost per acre	4.53	4.32	4.49
Percent of average crop acres worked with			
Average labor cost	107.7%	116.6%	107.9%
Average power and machinery cost	103.8%	114.8%	98.6%



THREE YEARS' SUMMARY REPORT OF THE FARM BUREAU-FARM MANAGEMENT SERVICE FOR THE FARMS OF 280 COOPERATORS ON THE HIGHER-VALUED LAND IN LIVINGSTON, MCLEAN, TAZEWELL, AND WOODFORD COUNTIES FOR THE YEARS OF 1929, 1930, AND 1931*

J. B. Andrews, W. A. Herrington,
M. L. Mosher, H. C. M. Case

It pays the individual farmer to make a careful study of his business even though earnings are low, as shown by this report for the three-year period of 1929, 1930, and 1931. This report will give to each cooperator a better idea of his real operating efficiency than any one year's report has furnished. This is true because it spreads over a period of years any unusual or accidental losses or gains, such as those caused by local floods or drought.

This report should prove helpful in three ways. First, it will enable each one to learn just how profitably he has been operating his farm as compared with the average of all farms, the most profitable or the least profitable farms. This comparison, then, shows how much opportunity he has to better his income.

In the second place, this report points out those parts of a cooperator's business that tend to make his income high or low. It is fully as important to build the business around its strong points as to be able to stop the leaks. The most successful farmers build their business around the things that they do well and at the same time they stop leaks in all parts of the farming operations.

The third way in which this report will prove of value to many is through use of the Farm Practice Analysis on pages 21 to 27. This tells in definite form about many of the practices followed by those who get best results along the more important lines of the farm work.

A number of the cooperators who started in 1925 are now making their farms pay net incomes of about $1,000 more per farm per year than they would be paying if they had continued to farm as they were doing in 1925 or as the average of their neighbors are doing now. They have done this by putting into practice on their farms many of the practices named in the back of this report.

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* The 280 farms included in this report are all on the higher-valued land of the area. Most of the tillable land on these farms is of the brown silt loam soil type. The records of 33 other farms on lower-valued lands in these counties are shown in a supplementary report prepared especially for those cooperators who operate farms on the lower-valued lands.

Capital Investments

The average total capital investment in these 280 farms was $60,700. This includes the land at pre-war values of about $190 per acre for the bare land. The larger investments on the more profitable farms are because the farms are larger as shown in Table 4 page 7. The investment in farm improvements was slightly less on the more profitable farms than on the less profitable ones and there was only about $140 greater investment in machinery although the farms were nearly 60 acres larger and had a larger portion of the land in crops. There was apparently an over-investment in buildings and fences and machinery on some farms.

Receipts and Net Increases

The total receipts and net increases amounting to $5,725 were twice as large per farm on the 56 most profitable as on the 56 least profitable farms. While the total livestock receipts on the more profitable farms were almost double those on the less profitable farms, the livestock investments were only about 25 percent greater. The receipts from hogs were nearly twice as great and the receipts from dairy products were over three times as great on the more profitable as on the less profitable farms. The poultry and egg sales were nearly 80 percent larger on the more profitable farms. Grain sales were more than twice as large on the more profitable farms although about 40 percent more feed was used for the livestock.

Expenses and Net Decreases

The total expenses and net decreases of $2,374 per farm on the most profitable farms were only about 12 percent more than on the less profitable farms although the farms were nearly 30 percent larger and had twice the income. The expenses and net decreases in value of farm improvements and machinery and equipment were actually larger on the smaller, less profitable farms. The greater depreciation in value of horses on the less profitable farms indicates a tendency that the horses on those farms are getting older and that they are not being replaced by colts. This applies to a certain extent even to the more profitable farms.

Any cooperator who finds that his expense on machinery and equipment was unusually large or small may well turn to Table 14, page 19 where he can compare this part of his farm record with that for other farms of the same size and having the same type of equipment.

Receipts Less Expenses

The receipts less expenses is the balance between the total receipts and inventory increases on the one hand and the total cash expenses, depreciation on farm improvements and machinery and inventory decreases on the other hand. In the case of a farm operated by the owner, it is the amount that the farm business has returned for the use of the farm and the labor of the operator and his family. It is the amount useable for family living, interest on debts, life insurance, payments on debts and investments. In case of a tenant farm it is divided between the tenant and landlord according to the provisions of the lease.

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Table 1--Investments, Receipts, and Expenses

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Capital investments				
Land	$	$ 45 846	$ 50 313	$ 38 737
Farm improvements		5 967	5 915	5 979
Livestock--Total		3 048	3 503	2 804
Horses		682	683	679
Cattle		1 269	1 544	1 143
Hogs		817	992	757
Sheep		112	99	81
Bees		10	4	6
Poultry		158	181	138
Machinery and equipment		2 164	2 197	2 058
Feed, grain and supplies		3 675	4 188	3 045
Total capital investment	$	$ 60 700	$ 66 116	$ 52 623
Receipts and net increases				
Livestock--Total	$	$ 2 446	$ 3 411	$ 1 791
Horses		---	---	---
Cattle		382	450	328
Hogs		1 324	1 835	1 029
Sheep		42	56	22
Bees		3	---	---
Poultry		93	109	70
Egg sales		138	187	96
Dairy sales		464	774	246
Feed, grain and supplies		1 667	2 213	1 014
Labor off farm		59	88	49
Miscellaneous receipts		12	13	9
Total receipts and net increases	$	$ 4 184	$ 5 725	$ 2 863
Expenses and net decreases				
Farm improvements	$	$ 278	$ 272	$ 305
Horses		24	12	42
Miscellaneous livestock		---	---	---
Machinery and equipment		532	502	542
Feed, grain and supplies		---	---	---
Livestock expense		50	58	52
Crop expense		247	276	224
Hired labor		484	667	464
Taxes		500	534	448
Miscellaneous expense		52	53	49
Total expenses and net decreases	$	$ 2 167	$ 2 374	$ 2 126
Receipts less expenses	$	$ 2 017	$ 3 351	$ 737

Farm Earnings

Farm earnings are expressed in different ways in Table 2, page 5. The rate earned on the investment has seemed to be the most satisfactory measure of general farm efficiency for corn-belt farms having large investments. These 280 farms averaged only 1.9 percent as the annual rate earned on the investment for these three years. The 56 most profitable farms average 3.81 percent and the 56 least profitable farms lacked .12 percent of the investment of having enough income to pay all expenses, depreciations and the operator's labor.

The net income per acre also is a desirable measure of the earnings from the entire farm business, especially on farms where the land has about equal productive value as is true of these farms. The net income per acre is determined by dividing the net income from investment and management by the total acres in the farm. There was a difference of $9.88 an acre in the net income between the more profitable and less profitable groups of farms, amounting to a total of $2,581.

The individual cooperator can best understand how his farm compares with others in general efficiency by seeing where his farm ranks in the rate earned column of the farm efficiency chart on page 17.

The 280 farms showed average annual inventory decreases of $789 per farm. The decreases were slightly greater on the less profitable farms.

There was an average annual cash balance of $2,806 a farm on the 280 farms. This amounted to $4,171 on the more profitable and only $1,592 on the less profitable groups of farms. The cash balance for the year is what the bank balance would show if all farm sales for the year had been deposited in one account and all expenses had been paid by checks on that account. The receipts less expenses is the balance when the change in inventories is combined with the cash balance for the year.

The 280 farm families used farm produce in the home that would have sold at farm prices for an average of $354 per farm per year. This item may be considered as family wages in addition to the amounts charged as operator's and family labor. It might be added to the farm receipts which would increase the receipts less expenses and the net income from the investment and management by $354 a year.

Farm Expenses

The total of the selected items of expense per acre as shown in Table 3, page 5 is one of the best measures that the individual cooperator can use to determine whether his expenses are running about as they should. These expenses averaged $12.15 on the more profitable and $14.08 on the less profitable farms. If they are particularly high or low on any farm, a glance down the column will enable one to see what items are responsible for the difference. If the acre expense for machinery and equipment is high, the cooperator may well turn to Table 15, page 19 to learn if the cause of the high expense lies in the auto, truck, tractor, or other machinery.

The expense per $100 gross income is another good measure that enables one to know whether his expenses are unduly high or unusually low for the amount of the gross farm income.

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Table 2--Farm Earnings

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
RATE EARNED ON INVESTMENT	%	1.90%	3.81%	-.12%
Inventories--beginning of year . .	$	$60 700	$66 116	$52 623
Inventories--end of year		59 911	65 296	51 768
Change in inventories.		-789	-820	-855
Total cash sales during year . . .		6 102	7 968	4 584
Total cash expenses during year. .		3 296	3 797	2 992
Cash balance for year.		2 806	4 171	1 592
Receipts less expenses	$	$ 2 017	$ 3 351	$ 737
Total unpaid labor		863	833	800
Operator's labor		656	648	647
Family labor		207	185	153
Net income from investment and management		1 154	2 518	-63
Return to capital and operator's labor and management		1 810	3 166	584
5% of capital invested		3 035	3 306	2 631
Labor and management wage.	$	$-1 225	$ -140	$-2 047
Net income per acre.	$	$ 4.83	$ 9.57	$ -.31
Family living furnished by farm. .				
Farm products used in home . . .	$	$ 354	$ 363	$ 331
Number in family		4.7	4.6	4.7
Farm produce used per person . .	$	$ 75	$ 79	$ 70

Table 3--Farm Expenses

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Total expense per acre of farm . .	$	$ 12.68	$ 12.19	$ 14.29
Selected items of expense. . . .		12.58	12.15	14.08
Farm improvements.		1.16	1.03	1.49
Machinery and equipment. . . .		2.23	1.91	2.64
Miscellaneous livestock expense		.21	.22	.25
Miscellaneous crop expense . .		1.03	1.05	1.09
Hired and home labor		5.64	5.71	6.18
Taxes.		2.09	2.03	2.19
Miscellaneous.		.22	.20	.24
Livestock and grain decreases. . .		.10	.04	.21
Horses		.10	.04	.21
Miscellaneous livestock.		---	---	---
Feed, grain and supplies		---	---	---
EXPENSE PER $100 GROSS INCOME. . .	$	$ 72	$ 56	$102

Size of Business

The standard of living of the farm family is largely dependent on the net income of the farm business over a period of years. Even though a farm may be efficiently operated, the total size or volume of business may be so small as to give an inadequate income. A fair to large size of business is, therefore, necessary if a good standard of living is to be provided for the farm family.

The total amount of labor required to care for the crops and livestock produced on the farm is one of the most satisfactory measures of the size of the farm business. This takes into account the percent of the farm in crops and the kind of crops as well as the size of the farm. It also takes into account the kind of livestock kept and fed as well as the number of livestock.

The man work unit is used as a measure of the amount of labor required. A man work unit is a measure of the amount of work a man will normally do in one ten-hour day. The average amounts of work done in one ten-hour day used in calculating the number of man work units of labor performed on these farms are based on detailed cost records kept during several years on about 20 Champaign and Piatt County farms. Tables showing the average time required for each of the crops and kinds of livestock and explanations of their use are given in the reports of the Farm Bureau-Farm Managment Service for 1930 and 1931.

As compared with the 56 less profitable farms, the 56 more profitable farms were 29.5 percent larger, had 3.7 percent more of the land in crops, and required at average efficiency 34.2 percent more labor on crops. They used 37.6 percent more feed and required 52.7 percent more labor on productive livestock. Altogether the more profitable farms had work that required 38.6 percent more hours of labor than the less profitable farms.

Intensity of Business

A fairly large business may be conducted on a small-sized farm by following an intensive type of farming such as dairying, poultry raising, or truck farming. A very large livestock business of most any kind may be developed on a relatively small farm by buying feed.

The more profitable farms were not only larger and had more livestock than the less profitable farms but they also conducted a more intensive business. This is shown by the $7.78 more gross income per acre, the 65 cents an acre more feed used, the 19.1 pounds an acre more pork produced and the .14 more man work units per acre.

Organization of Business

In general, the more profitable farms were organized much the same as the less profitable farms. The most important differences noted in Table 6, page 7 are that the more profitable farms had lower investments per acre in farm improvements, horses, and machinery, and slightly higher investments in productive livestock. These investments amounted to 23.0 percent less an acre in farm improvements, 21.7 percent less an acre in horses, 16.9 percent less in machinery, and 3.4 percent more in productive livestock. Approximately the same percent of the gross income was from grain in the two groups of farms.

A study of Table 1, page 3, shows that during this three-year period farms with more hogs, dairy cattle, and poultry had some advantage. However, the most important thing brought out in this connection by a study of these records is that the amount and kind of livestock are not so important as is the efficiency with which the livestock is handled.

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Table 4--Size of Business

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Total Man Work Units.	____	426.3	496.0	357.8
On crops.		215.6	241.9	180.3
On productive livestock		174.2	216.8	141.9
On horses		36.5	37.3	35.6
Size of farm--total acres		238.9	263.1	204.8
Percent of farm tillable. . . .		91.9%	90.7%	91.1%
Percent of tillable land in crops		88.7%	90.1%	87.5%
Total investments		$60.700	$66 116	$52 623
Total receipts and net increases. .		4 184	5 725	2 863
Value of feed to livestock.		2 114	2 581	1. 876

Table 5--Intensity of Business

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Gross income per acre	$_____	$ 17.51	$ 21.76	$ 13.98
Feed used per acre.		8.85	9.81	9.16
Pounds of pork produced per acre. .		80.1	94.9	75.8
Man work units per acre		1.78	1.89	1.75

Table 6--Organization of Business

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Investments per Acre--Total	$	$ 254.08	$ 251.32	$ 256.96
Real estate	____	216.89	213.72	218.34
Land.		191.91	191.24	189.15
Farm improvements		24.98	22.48	29.19
Operating capital	$_____	$ 37.19	$ 37.60	$ 38.62
Horses.		2.85	2.60	3.32
Productive livestock.		9.90	10.73	10.38
Machinery and equipment		9.06	8.35	10.05
Feed, grain, and supplies . . .		15.38	15.92	14.87
Percent of income from feed, grain and supplies		39.8%	38.6%	35.4%

Crop Yields

The yields of crops had more to do with placing farms in the high or low groups of farms than any other factor except efficiency of livestock. This is shown clearly in Table 14, page 18. Year after year farm records have shown that crop yields and livestock efficiency have been the most important factors in determining net farm incomes in all parts of the state.

The advantage in yield of the 56 more profitable over the 56 less profitable farms was 4.9 bushels for corn, 5.4 bushels for oats, 2.5 bushels for winter wheat, 1.9 bushels for spring wheat, and 6.9 bushels for barley. These differences seem small, but when all were added together with similar differences for hay and pasture and average prices for the three years were applied, they were found to account for nearly $600 a farm a year in favor of the more profitable farms.

A study of the records of the farms that have been in the Farm Management Service for seven years and that have shown most improvement indicates that changes in practices that have increased crop yields have had more to do with the increased incomes than any other factors excepting possibly those changes that influence livestock efficiency. Detailed cost of production studies show that the cost of producing a bushel of grain or a ton of hay decreases rapidly with increase in yield per acre.

The operators of the most profitable farms are constantly on the alert to learn of new varieties of seed or new practices that will enable them to increase their yields per acre. The more essential practices followed by those who get best yields are listed in the Farm Practice Analysis attached to this report.

Cropping Systems

The profitableness of the cropping system is fairly well measured by the relative portions of tillable land in the higher, medium, and lower profit crops. The common crops grown in this area are listed in the higher, medium, and lower profit groups in Table 8, page 11 according to the same classification that has been used for the past seven years.

The more profitable group of farms had 3.9 percent more of the tillable land in the higher profit crops, 1.6 percent more in the medium profit crops, and 5.5 percent less in the lower profit crops than were found on the less profitable farms. Like the differences in yields, these differences seem small, but they are enough to have caused an average annual advantage of nearly $200 in favor of the more profitable farms. See Table 14, page 18.

There is probably no change that has been made during the past seven years on so many farms as the change to a definite cropping system that reduces the acreage of oats, timothy and blue grass and increases the acreage of alfalfa, sweet clover, and corn.

On most farms where the percent of tillable land in the higher profit plus one-half the medium profit crops is below the average there is opportunity to improve the farm income through a change in the cropping system. A few farms plans that provide for profitable cropping systems as well as for good soil improvement programs, sanitary livestock production, and low labor and machinery costs are shown in the maps on page 10. These are maps of actual farms included in the Farm Bureau-Farm Management Service.

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Table 7--Crop Yields

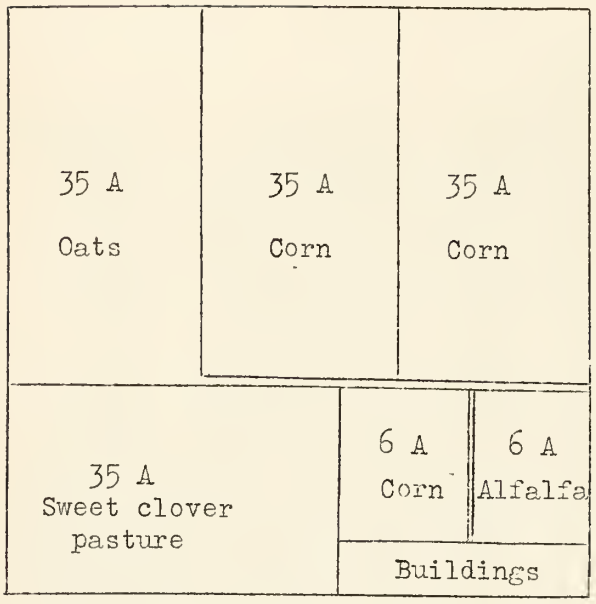
Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Grain crops--bushels per acre				
Corn		44.2	47.2	42.3
Oats		43.9	47.6	42.2
Winter wheat		25.0	27.5	25.0
Spring wheat		22.0	23.0	21.1
Barley		29.2	31.7	24.8
Soybeans		20.7	21.0	22.1
Hay crops--tons per acre				
Timothy		1.2	1.3	1.2
Clover		1.1	1.1	1.0
Alfalfa		2.4	2.5	2.3
Clover and timothy		1.4	1.6	1.1
Soybeans		1.9	1.9	1.8
Crop index 1/		100.0	107.0	96.3
Acres of above crops grown		187.9	203.8	158.7
Acres required at average yields		187.9	218.1	152.8

1/ The crop index is the percent of the average yields of all grain and hay crops, listed in Table 7, weighted according to the acres of each crop. It is calculated by dividing the total acres required at average yields to produce the amounts of crops grown on the individual farm by the total acres of those crops grown on the farm.

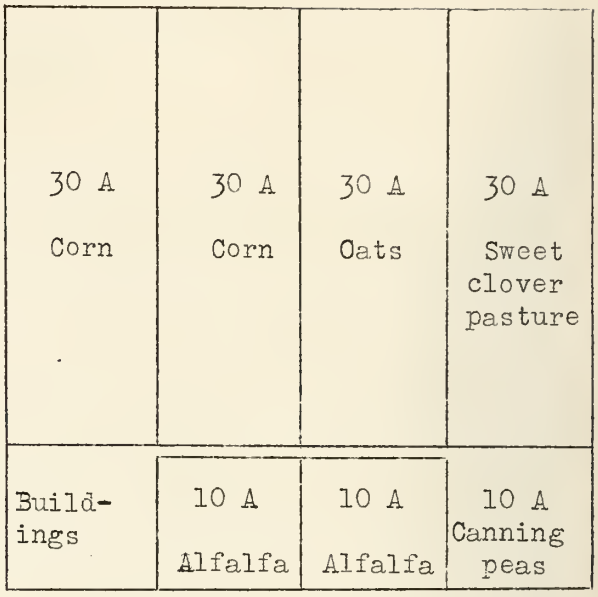
They show only a few rotations and farm plans that might be included. While all these maps are of 160 acre farms, the same cropping systems may be adapted to larger or smaller farms.

Good measures of the relative profitableness of different cropping systems in an area where nearly all crops are feed crops are the total pounds of useable, digestible nutrients produced per acre per year, their cost per 100 pounds, and the percent that is protein. In Table 9, page 11, approximate figures for these measures are given for different rotations. In making this analysis, normal yields for the different rotations are used. All digestible nutrients in grain were considered useable, while only 33 percent of the corn stover, 50 percent of the oat straw, 50 percent of the stubble clover, and 80 percent of the clover and alfalfa were used.

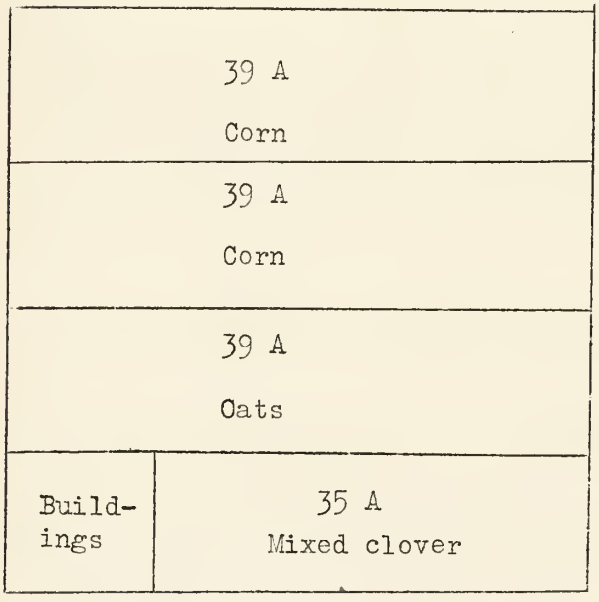
Maps of Farms With Profitable Cropping Systems



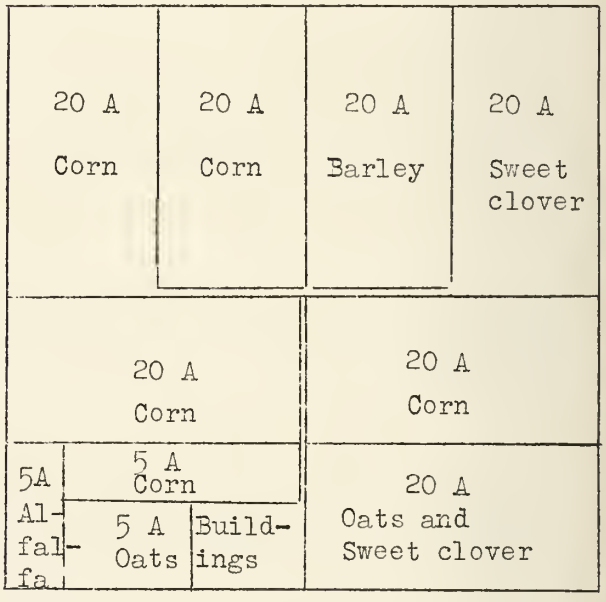
77 percent higher profit crops



80 percent higher profit crops



75 percent higher profit crops



77 percent higher profit crops

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Table 8--Percent of Tillable Land in Higher, Medium, and Lower Profit Crops

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Percent of tillable land in				
Higher profit crops--total	____%	62.3%	64.9%	61.0%
Corn		47.9	49.0	46.9
Winter wheat		5.5	5.3	5.5
Alfalfa		2.0	2.4	2.5
Sweet clover		5.0	4.6	5.1
Canning and miscellaneous		1.9	3.6	1.0
Medium profit crops--total	____%	14.2%	15.3%	13.7%
Spring wheat		1.8	2.8	.9
Barley		3.1	4.1	3.0
Soybeans		3.1	2.6	3.5
Clover		2.1	1.9	2.1
Clover and timothy mixed		2.5	2.3	2.6
Miscellaneous		1.6	1.6	1.6
Lower profit crops--total	____%	23.5%	19.8%	25.3%
Oats		19.9	17.3	20.2
Timothy		1.2	.7	1.8
Blue grass		2.3	1.7	2.9
Miscellaneous		.1	.1	.4
ALL HIGHER PLUS ONE-HALF MEDIUM	____%	69.4%	72.6%	67.8%
Legumes left down		16.3	16.1	17.0
Crop following first year sweet clover		3.6	4.8	3.4

Table 9--Approximate Amounts and Cost of Digestible Feed Produced by Different Rotations

Rotation					Approximate total useable digestible feed per acre per year	Percent protein	Approximate cost per 100 lbs. digestible feed
1st year	2nd year	3rd year	4th year	5th year			
Corn	Oats	--------	--------	--------	1 659 lbs.	8.4%	1.30
Corn	Oats (Sw.Cl.)	--------	--------	--------	2 298	9.7	.97
Corn	Oats	Clover	--------	--------	2 149	10.3	1.06
Corn (Sw.Cl.)	Corn	Oats (Sw.Cl.)	--------	--------	2 325	9.1	.99
Corn	Corn	Oats	Red. Cl.	--------	2 356	9.5	1.00
Corn	Corn	Oats	Sw.Cl. Alfalfa	--------	2 719	11.4	.89
Corn	Corn	Oats	Wheat	Red. Cl.	2 185	9.6	1.08
Corn	Corn	Oats	Sw. Cl.	Alfalfa	2 814	13.0	.87

Amount and Efficiency of Productive Livestock

The value of feed fed per acre to productive livestock gives an idea of the relative importance of the livestock enterprise to the whole farm business. The total amounts of feed fed to and the total returns from productive livestock indicate the total size of the livestock enterprise. In the analysis in Table 10, page 13, the total returns from each class of livestock include the products used on the farm as well as those sold. Unless it was well handled, a large amount of livestock was not an advantage during this period as far as net income on the total farm investment was concerned. The least profitable as well as the most profitable farms were livestock farms.

Efficiency of livestock production as measured by the returns for each $100 of feed fed to all productive livestock apparently had more affect than any other one factor on net farm incomes in this area during the three-year period of 1929, 1930, and 1931. See Table 14, page 18. Cattle classified as beef cattle in this report were those on farms where less than 25 percent of all cattle were milk cows. Those classified as mixed cattle were those where from 25 to 50 percent of the cattle were milk cows and those classified as dairy cattle were those where 50 percent or more of the cattle were milk cows.

Beef cattle returned $91 for each $100 of feed fed during the three years on the more profitable and only $78 on the less profitable farms. Unusual depreciation in values at the end of the period wiped out any profits of the first year and left a loss for the period. Mixed cattle herds returned $133 for each $100 of feed on the more profitable and only $88 on the less profitable farms.

Dairy cattle herds returned $172 for each $100 of feed on the more profitable and only $126 on the less profitable farms. They returned $152 for each $100 of feed on the average of all farms. Dairying was relatively profitable during this period as shown by the relative returns for feed fed and by the fact that farms with the more milk cows on them tended to fall into the more profitable group of farms. The more profitable farms averaged 7.2 milk cows per farm while there were only 4.3 milk cows on the less profitable farms. The much greater efficiency of the dairy herds on the more profitable farms is also shown by their average production of 7,501 pounds of milk and $126 of dairy returns per cow as compared with 5,911 pounds of milk and $87 of dairy returns on the less profitable farms.

Hogs returned $136 for $100 of feed on the more profitable and only $112 on the less profitable farms. There was an average of about 60 percent more pork per farm produced on the more profitable than on the less profitable farms. The feed cost was only $5.56 per 100 pounds on the more profitable as compared with $6.25 on the less profitable farms. The average returns were 56 cents per 100 pounds greater on the more profitable farms.

Sheep production is a very minor enterprise on these farms, but what there were returned $27 more for each $100 of feed fed to them on the more profitable than on the less profitable farms. The poultry project was a larger enterprise on the more profitable than on the less profitable farms as shown by the 122.6 and 94.0 hens per farm on the respective groups of farms. The differences of $38 for each $100 invested in the poultry flock and of 18.3 eggs per hen in favor of the more profitable farms indicates that poultry flock efficiency was a worthwhile factor that contributed to the better incomes on the more profitable farms.

The livestock efficiency index shows the relative efficiency of all livestock better than any other factor. It takes into account the amount of each kind of livestock as well as the returns for feed fed. The more profitable farms received 11.3 percent more and the less profitable farms 15.3 percent less than the average of all farms for the same amounts of feed fed to the same kinds of livestock.

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Table 10--Amount and Efficiency of Productive Livestock[1/]

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Total feed to all productive livestock	$	$2 114	$2 581	$1 876
Beef cattle		1 449 (49)	1 378 (10)	1 660 (9)
Mixed cattle		728 (84)	929 (16)	729 (21)
Dairy cattle		600 (140)	852 (28)	441 (26)
Hogs		1 083 (273)	1 327 (54)	972 (56)
Sheep		156 (105)	190 (19)	91 (24)
Poultry		139 (280)	159 (56)	120 (56)
Total feed used per acre	$	$ 8.85	$ 9.81	$ 9.16
Total returns from productive livestock	$	$2 731	$3 702	$2 053
Beef cattle		1 339	1 251	1 302
Mixed cattle		818	1 233	642
Dairy cattle		913	1 467	555
Hogs		1 373	1 810	1 093
Sheep		109	160	52
Poultry		304	374	230
Total returns per acre	$	$ 11.43	$ 14.07	$ 10.02
Returns per $100 feed to all livestock	$	$ 129	$ 143	$ 109
Beef cattle		92	91	78
Mixed cattle		112	133	88
Dairy cattle		152	172	126
Hogs		127	136	112
Sheep		70	84	57
Total returns from all livestock if fed with average efficiency	($)	($2 731)	($3 325)	($2 425)
Livestock efficiency index[2/]		100.0	111.3	84.7
Poultry				
Returns per $100 invested	$	$ 201	$ 215	$ 177
Number of hens		109.5	122.6	94.0
Number of eggs per hen		98.3	107.7	89.4
Hogs				
Pounds of pork produced		19 132	24 958	15 554
Returns per 100 pounds pork	$	$ 7.27	$ 7.59	$ 7.03
Feed cost per 100 pounds pork		5.74	5.56	6.25
Dairy cows				
Number of cows milked		5.5	7.2	4.3
Pounds of milk per cow		6 750	7 501	5 911
Dairy returns per milk cow	$	$ 110	$ 126	$ 87

1/ A figure in parenthesis designates the number of farms which that item represents.
2/ The livestock efficiency index is the percent of the average returns from feed fed to all livestock weighted according to the amount of feed fed to each class of livestock. It is calculated by dividing the total returns from all productive livestock on a farm by the total returns from all livestock if each class had been fed with average efficiency.

Labor, Power, and Machinery Costs

The labor efficiency index used in Table 11, page 15, and in the farm efficiency chart on page 17 indicates the number of days of productive work done per man on the individual cooperator's farm for each 100 days of productive work done per man on the average of farms having the same labor requirements on crops and on livestock. The man work units per man increase quite rapidly with the increase in the size of the farm and with the amount of livestock. The labor efficiency index will enable each cooperator to compare the amount of labor used on his farm with the amount used on farms like his as regards size and amount of livestock.

The labor cost per crop acre was slightly more on the more profitable group of farms than on the average of all farms. The labor efficiency as measured by the labor efficiency index was only slightly better. It should be noted, however, that with approximately the same amount of labor for the work done, the returns per acre were $3.95 greater.

The horse and machinery efficiency index for a farm is calculated by finding the number of acres of crops worked on that farm with the same horse and tractor and machinery cost with which 100 acres of crops are worked on the average farm of the same size and having the same amounts of livestock feeding to do. The more profitable farms worked at the rate of 121.2 acres of crops with the same horse and machinery cost with which 100 acres were worked on the average of all farms, while the less profitable farms worked only 92.9 acres with the same cost.

The individual cooperator may well study his costs for the use of auto, truck, tractor, other machinery and labor as shown in Table 15, page 19. This will help some to locate the source of an unusually high or low cost.

Amounts and Prices of Some Products Sold

Only a small portion of the difference in earnings between the more profitable and the less profitable farms was due to differences in prices received for products sold. Some of the difference of two and three cents a bushel for grain was due to difference in quality of grain sold rather than difference in time of selling. Several dairy farms did have a distinct advantage because of a better market for dairy products.

Some cooperators will find that the average price received for all products was an important factor in making their incomes high or low. However, it is rare that this is so important as crop yields, cropping system, livestock efficiency, or labor and horse power and machinery efficiency.

Farms on Higher-Valued Land of Livingston, McLean,
Tazewell, and Woodford Counties
Averages for Three Years of 1929, 1930, and 1931

Table 11--Labor, Power, and Machinery Costs

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Labor				
Average number of men		1.87	2.04	1.73
Labor cost per crop acre	$	$ 6.80	$ 6.82	$ 7.62
Man work units per man		228.0	243.1	206.8
Labor efficiency index 1/		100.0	102.2	96.4
Power and machinery				
Average number of work horses		6.3	6.3	6.2
Percent of farms with tractors		83.1	83.9	79.2
Percent of farms with trucks		39.9	45.8	31.5
Feed cost per workable horse	$	$ 57	$ 59	$ 58
Cost per crop acre				
Horse feed and depreciation		$ 1.88	$ 1.78	$ 2.45
Machinery		2.73	2.33	3.32
Horses and machinery		4.61	4.11	5.77
Labor, horses, and machinery		11.41	10.93	13.39
Horse and machinery efficiency index 2/	_____	100.0	121.2	92.9

Table 12--Amounts and Prices of Some Products Sold

Items	Your farm	Average of 280 farms	56 most profitable farms	56 least profitable farms
Amounts sold				
Corn--bushels		2 390	2 757	1 688
Oats--bushels		1 063	971	867
Wheat--bushels		291	323	209
Pork--pounds		18 654	24 473	15 458
Milk--pounds		36 959	55 159	25 418
Eggs--dozens		606	704	428
Prices received				
Corn--cents per bushel	$	$ .70	$ .71	$ .69
Oats--cents per bushel		.34	.35	.32
Wheat--cents per bushel		.84	.82	.80
Pork--dollars per 100 pounds		8.18	8.43	8.06
Milk--dollars per 100 pounds		1.66	1.78	1.49
Eggs--cents per dozen		.24	.25	.25
Percent of average price received for all	_____	100.0%	102.9%	97.2%

1/ There was an average of ____ man work units per man on farms having the same labor requirements on crops and the same on livestock as the farm for which this report was prepared.

2/ There was an average cost of $____ per crop acre for horses and machinery on farms of the same size and with the same amount of feed used per acre as on the farm for which this report was prepared.

Explanation of the Farm Efficiency Chart

(See Chart on page 17)

The figure in any column just above the double line across the middle of the chart is for the middle farm of all the farms to which that factor applies; that is, there are as many farms above that figure as there are below it.

The figure in any column just above the top single line across the chart represents approximately the most efficient farm in the factor named at the top of that column. The figure at the bottom of each column of the chart represents approximately the least efficient farm in that factor.

The figure in any column just above the second from the bottom line across the chart represents approximately the most efficient of the one-fifth of the farms which are lowest in that factor. It also represents approximately the least efficient in the next to the lowest one-fifth of the farms in that factor.

Likewise, the figure in any column just above the next to the top line across the chart represents approximately the least efficient of the one-fifth best farms in that factor. It also represents approximately the most efficient of the second to the best one-fifth group of the farms in that factor. The other lines separate the middle group in each factor from the groups next to it.

By drawing a line across each column at approximately the place which represents the efficiency of his farm in each factor and then, by filling in with a colored crayon or pencil the space below such lines, a cooperator can see clearly where his farm stands in efficiency in each factor.

Table 13--Relation of Net Income From Investment to Number of Factors in Which Farms Excel

Number of factors in which farms excel	Number of farms	Rate earned	Net income from average capital at rate earned of group
5	12	3.52	$2 137
4	40	3.06	1 857
3	92	2.20	1 335
2	87	1.44	874
1	37	.80	486
0	12	.66	401

The following five efficiency factors were used in the analysis shown in Table 13 above: (1) crop index; (2) livestock efficiency index; (3) percent of tillable land in high profit plus one-half of that in medium profit crops; (4) labor efficiency index; and (5) horse and machinery index.

The 12 farms that were above the average of all 280 farms in the five factors earned annually an average of 3.52 percent on the investment for the three years. The 12 farms that were below the average in all five factors earned an average of only .66 percent per year. This difference of 2.86 percent amounts to $1,736 when applied to the average farm capital.

The value of well-balanced farming in which all important parts of the business are done at least fairly well is clearly shown from these data.

Rate earned on investment	Gross income per acre	Factors that affect the gross income per acre: Crop yields: Corn Bu. per acre	Crop yields: Oats Bu. per acre	Crop yields: All grain and hay crop index	%tillable land in higher profit crops	Feed per acre to livestock	Returns per $100 feed: cattle	Returns per $100 feed: Hogs	Returns per $100 feed: Sheep	Returns per $100 invested in poultry	All livestock efficiency index	Price index	Man labor efficiency index	Horse and machinery efficiency index	Expense per $100 gross income	Size of business Total man work units
7.0	48	62	70	140	96	44		250	293	425	160	123	148	186	166	1135
The best one-fifth of the farms in each factor come between this line and the next line below.																
2.9	21	49	51	111	77	12		144	102	263	112	105	112	123	89	527
The second best one-fifth of the farms in each factor come between this line and the next line below.																
2.1	18	45	47	104	71	9		129	79	207	103	101	102	109	78	444
1.7	17	44	45	100	69	8		124	69	192	100	100	99	104	74	400
The middle farm in each factor comes to this line.																
1.5	16	43	42	98	67	7		120	60	176	96	99	95	98	70	369
The second lowest one-fifth of the farms in each factor come between this line and the next line below.																
.7	14	40	38	89	61	5		107	31	140	86	93	87	88	63	308
The lowest one-fifth of the farms in each factor come between this line and the bottom line.																
-2.4	8	25	25	61	44	1		50	-133	30	50	74	62	52	41	155

Analysis of Horse Power, Mechanical Power, and Machinery Costs

Horse power, mechanical power and machinery costs on corn-belt farms make up a larger part of all farm operating costs than any other single item except labor. It has been difficult for many who have cooperated in the Farm Management Service to see wherein their horse and machinery costs were particularly high or low. In order to analyze these costs more completely the farms on the higher-valued lands have been grouped according to the size of farm and use of tractor and truck in Table 15, page 19.

By comparing the records of his farm with the average of other farms of the same size and having the same type of power and equipment as his, each cooperator may locate rather definitely the places that his horse and machinery costs are particularly high or low. The information in this table is presented only for the purpose indicated. The data as presented should not be used as a means of drawing conclusions regarding the relative profitableness of farming with or without tractors or trucks, or on different sizes of farms.

Location of Differences in Income Between the More Profitable and the Less Profitable Farms

Much of the difference of $2,386 in the average net earnings between the 56 most profitable and the 56 least profitable farms is accounted for in Table 15.

Quality of land. The 280 farms used in this report are all on the better corn lands of these four counties. In a few cases there is some rough pasture land in addition to the good farm land. It is shown in Table 6, page 7, that the average value of land in the two groups was almost the same. The proportions of tillable land and of tillable land in crops were also approximately the same. (Table 4, page 7).

Table 14--Location of Differences in Incomes Between the 56 Most Profitable and the 56 Least Profitable Farms

Factors considered	Average difference
Efficiency of livestock	$ 719
Crop yields	591
Cost of power and machinery	296
Cropping system	192
Miscellaneous expenses	174
Cost of man labor	119
Prices of grain	86
Amount of livestock	45
Total located differences	$2 222
Differences in net incomes--3.93 percent of average capital	$2 386

Efficiency of livestock. The 56 more profitable farms realized $143 from each $100 worth of feed fed to productive livestock while the 56 least profitable farms received only $109 or a difference of $34 for each $100 worth of feed used. The average annual amount of feed used on all farms was valued at $2,114 at farm prices. The larger returns for each $100 of this feed used on the more profitable farms accounts for $719 difference in average income between the two groups of farms. This does not include the cost of keeping horses on the two groups of farms. Only about 45 percent of the grain produced on these farms during this three-year period was fed, the rest being sold as grain. On farms where most of the grain is fed on the farms, livestock efficiency becomes relatively more important.

Table 15--Analysis of Horse Power, Mechanical Power, and Machinery Costs
Averages of three years of 1929, 1930 and 1931

Items	Your farm	Farms under 180 acres			Farms of 180 to 299 acres			Farms of 300 acres or more		
		With tractor and truck	With tractor without truck	Without tractor or truck	With tractor and truck	With tractor without truck	Without tractor or truck	With tractor and truck	With tractor without truck	Without tractor or truck
Number of farms		8	27	15	29	39	7	13	19	1
Investments										
Truck		$ 254	---	---	240	---	---	234	---	---
Auto		253	212	177	229	230	166	173	170	353
Tractor		405	452	---	519	509	---	743	631	---
Other machinery		1 068	1 091	883	1 477	1 311	1 013	2 068	1 685	801
All machinery		1 985	1 755	1 060	2 465	2 050	1 179	3 218	2 486	1 154
Horses		382	542	601	658	592	877	826	1 037	1 032
Horses and machinery		2 367	2 297	1 661	3 123	2 642	2 056	4 044	3 523	2 186
Expenses and net decreases										
Truck		$ 110	---	---	99	---	---	108	---	---
Auto		120	112	93	97	120	105	103	121	111
Tractor		187	157	---	210	216	---	401	362	---
Other machinery		195	166	124	221	193	151	271	317	175
Total machinery cost		612	435	217	627	529	256	883	800	286
Horse feed and depreciation		291	264	354	351	350	483	434	545	625
Machinery and horse cost		903	699	571	978	879	739	1 317	1 345	911
Labor cost		1 068	936	829	1 312	1 300	1 194	1 788	1 871	1 392
Labor, machinery & horse cost		1 971	1 635	1 400	2 290	2 179	1 933	3 105	3 216	2 303
Expenses per acre of crops										
Machinery		$ 4.60	3.48	2.20	3.23	2.96	1.56	2.81	2.50	1.02
Horse feed and depreciation		2.19	2.11	3.60	1.81	1.96	2.94	1.38	1.70	2.22
Machinery and horses		6.79	5.59	5.80	5.04	4.92	4.50	4.19	4.20	3.24
Labor		8.01	7.46	8.43	6.76	7.26	7.27	5.70	5.85	4.94
Labor, machinery & horses		14.80	13.05	14.23	11.80	12.18	11.77	9.89	10.05	8.18
Total acres in farm		155.3	152.1	127.0	237.3	221.4	213.5	386.1	388.4	320.0
Acres in crops		133.3	125.4	98.4	194.2	178.9	164.3	314.0	319.8	281.7
Feed per acre to livestock		14.09	8.88	10.45	8.77	9.35	7.60	7.62	6.53	3.36

Crop yields. The 56 most profitable farms produced 4.9 bushels more of corn, 5.4 bushels more of oats, and proportionately higher yields of other crops than the 56 least profitable farms as shown in Table 7, page 9. When these differences are multiplied by the acres grown on the average of the farms and by the average farm prices, it is found that there was a total difference of $591 in favor of the more profitable farms.

Cost of power and machinery. The total cost per acre of horse and tractor power and machinery on the most profitable farms amounted to only $3.36 per acre as compared with $4.60 on the least profitable farms. This difference of $1.24 an acre would amount to $296 less cost per farm in favor of the more profitable farms.

Cropping system. The calculated advantage that the 56 most profitable farms had because of better cropping systems amounted to $192 per farm per year. This analysis is based on the acreages, yields, and values of all grain, hay, and pasture crops grown on these farms. Only a part of the data on which the analysis is based is included in this report. Most of the advantage that the more profitable had over the less profitable farms was in larger acreages of corn and canning crops and smaller acreages in oats, timothy, and bluegrass.

Miscellaneous expenses. Expenses other than for labor and power and machinery amounted to $4.53 and $5.26 an acre on the high and low groups of farms respectively. This difference of 73 cents an acre accounted for $174 difference in expense in favor of the more profitable farms.

Cost of man labor. The total labor cost, including the operator's and family labor at hired man rates was $5.57 an acre on the 56 most profitable farms and $6.07 on the less profitable ones. This difference of 50 cents an acre applied to the average size of all farms amounts to $119 in favor of the more profitable farms.

Prices of grain. The 56 more profitable farms received an average of two cents a bushel more for corn and wheat and three cents more for oats than the 56 less profitable farms. These differences applied to the amounts sold on the average of all farms accounted for $86 in favor of the more profitable farms.

The difference of 37 cents per 100 pounds of pork and of 29 cents per 100 pounds of milk as shown in Table 12, page 15, applied to the amounts sold on the average farm gave an advantage of $176 to the more profitable farms. This is not included in the analysis in Table 14, page 18, because it is a part of the $719 advantage of the better farms because of livestock efficiency.

Amount of livestock. There was 65 cents worth more feed fed per acre on the more profitable than on the less profitable farms. This accounts for about $45 more income on the more profitable farms. These records bring out clearly the fact that a large amount of livestock does not add to the net income of the farm unless the livestock is handled with at least average efficiency.

FARM PRACTICE ANALYSIS

The outline of good farm practices shown on the following pages has been prepared as a guide for individual farmers in a study of their business. Many members of the staff of the College of Agriculture have contributed towards its preparation. No explanations of its use are given because it was prepared for use under conditions where discussions will be guided by someone familiar with it.

FARM PRACTICE ANALYSIS

Farm of _____ Address _____

Good farm practices	Extra cash Expense required to put practices into operation	Did you follow the practices last year? Yes	Part	No
Land drainage				
1. Keep tile outlets open	none			
2. Work land so as to avoid washing	none			
3. Stop washing of ditches	some			
4. Provide open drains to tile in ponds	some			
5. Put in tile where needed	much			
6. Provide tile outlets and inlets where needed	much			
7. Terrace land where needed	much			
Soil improvement and cropping system				
8. Spread all manure including stack bottoms	none			
9. Have 75 percent or more tillable land in higher profit crops	none			
10. Plan cropping system so as to provide a balanced ration of home grown feed as much as possible	none			
11. Sow clover in all small grain on sweet soil except where followed with wheat	some			
12. Leave 20 to 25 percent of tillable land in a deep-rooted legume or plow under first year sweet clover on 33 to 50 percent of tillable land	some			
13. Keep tillable land occupied by growing crop all of cropping season	some			
14. Use limestone where needed	much			
15. Use phosphate where profitable	much			
16. Use potash where profitable	much			
Seed bed preparation and cultivation				
17. Plow heavy soils in fall	none			
18. Work fall plowed ground early in spring	none			
19. Disc stalk ground before plowing	none			
20. Work spring plowed ground immediately after plowing	none			
21. Keep corn and bean ground free from weeds before planting	none			
22. Protect the stand of corn during cultivation	none			
23. Plow wheat ground early	none			
24. Prepare solid seed bed for wheat or alfalfa	none			

Good farm practices	Extra cash expense required to put practices into operation	Did you follow the practices last year?		
		Yes	Part	No
Seed corn selection and preparation				
25. Select early from strong standing stalks	none			
26. Cull out light weight, dull appearing, or shallow-grained ears	none			
27. Use a known high yielding variety	little			
28. Get seed from original source at least once in three years	little			
29. Protect from dampness and severe freezing	little			
30. Test each ear for germination	some			
31. Plant only apparently disease-free ears	some			
32. Treat untested seed for disease	little			
Small grain seed selection and preparation				
33. Test seeds for germination	none			
34. Fan and grade seed	none			
35. Use known high yielding strains	little			
36. Treat seed for disease	little			
Alfalfa, clover and grass seeds				
37. Use known productive, acclimated strains	none			
38. Test seeds for germination	none			
39. Insure freedom from bad weed seeds	none			
Quality of grain				
40. Use medium maturing variety of corn	none			
41. Plant corn at early to medium date	none			
42. Sort out rotten corn	none			
43. Store corn in well-ventilated cribs	little			
44. Avoid piling up of silks and shelled corn under spouts	little			
45. Use early ripening oats	none			
46. Use pure variety of wheat	little			
47. Sow spring wheat, oats and barley early	none			
48. Adjust rate of seeding to productivity of land	none			
Care of pastures and meadows				
49. Manure permanent pastures where profitable	none			
50. Mow weeds in pastures	none			
51. Clip weeds in stubble	none			
52. Reseed pastures where profitable	some			
53. Lime permanent pastures where profitable	much			

Good farm practices	Extra cash expense required to put practices into operation	Did you follow the practices last year?		
		Yes	Part	No
Care of cattle				
54. Dispose of non-breeding or irregular breeding cows	none			
55. Test breeding stock for tuberculosis and dispose of reactors	none			
56. Test breeding stock for abortion and isolate or dispose of reactors	little			
57. Use productive grade or purebred cows	some			
58. Use good quality purebred sires	some			
59. Cool milk immediately after milking	little			
60. Use boiling water or chemical sterilizer to clean all dairy utensils	little			
61. Keep down dust while milking	none			
62. Feed milk cows balanced rations including ground feed in proportion to milk production	little			
63. Keep beef cows on pasture and roughage with little or no grain	none			
64. Full-feed home raised beef calves from weaning time until ready for market	none			
65. Sell calves as breeding stock, veal, fat calves, or baby beef	none			
66. Feed balanced rations to beef cattle on feed	little			
67. Study markets to judge the best types of steers to feed and the best times to buy and sell	none			
Care of hogs				
68. Select healthy, well-developed gilts from large litters	none			
69. Feed young gilts a growing ration	none			
70. Use purebred sires	little			
71. Use purebred or high grade sows	some			
72. Select healthy, active, well-developed sires from large litters	none			
73. Flush sows at breeding time	none			
74. Feed balanced rations to pregnant sows	none			
75. Feed bred sows at a distance from sleeping quarters	none			
76. Avoid injury to sows by narrow doors, high sills or crowded pens	none			
77. Use guard rails in farrowing pens	none			
78. Clean sows before farrowing	none			
79. Scrub farrowing pens with hot lye water	none			
80. Haul sows and pigs to clean pasture	none			
81. Keep pigs in clean pasture until at least 100 pounds weight	none			

Good farm practices	Extra cash expense required to put practices into operation	Did you follow the practices last year?		
		Yes	Part	No
Care of hogs (continued)				
82. Castrate boars at two to four weeks of age	none			
83. Study markets to judge the best types, best weights, and best times to sell	none			
84. Vaccinate pigs at four to six weeks or shortly after weaning	some			
85. Feed balanced ration to growing pigs	some			
86. Feed balanced ration to fattening hogs	some			
Care of sheep				
87. Flush ewes at breeding time	none			
88. Dock and castrate lambs at from ten to fifteen days of age	none			
89. Keep sheep on rotated pasture	none			
90. Study markets to judge the best types, best ages, best weights and best times to sell	none			
91. Treat sheep to destroy worms	little			
92. Use good purebred or grade ewes	some			
93. Use good purebred sires	some			
Care of poultry				
94. Hatch chicks early	none			
95. Raise chicks on clean ground	none			
96. Keep poultry house clean	none			
97. Provide four to five square feet of floor space for each hen in winter	none			
98. Grade eggs so as to sell at a premium	none			
99. Provide warm water in winter	none			
100. Use purebred, high producing hens	some			
101. Use purebred cockerels from high producing flocks	some			
102. Test breeding flock for disease and dispose of reactors	some			
103. Use balanced laying mash all the year	some			

Good farm practices	Extra cash expense required to put practices into operation	Did you follow the practices last year?		
		Yes	Part	No
Horse power				
104. Keep only necessary number of workable horses	none			
105. Dispose of useless horses	none			
106. Feed little grain to idle horses	none			
107. Keep idle horses on pasture and cheap roughage	none			
108. Feed grain and good hay to horses at work	none			
109. Keep feet in good condition by trimming and shoeing as needed	none			
110. Keep collars well fitted and clean	none			
111. Protect necks by use of tongue trucks and properly adjusted harness	none			
112. Raise or buy colts to replace old horses	some			
113. Use modern hitches for heavy field work	some			
Machinery				
114. Study to invest in machinery according to needs of farm	none			
115. Overhaul and repair machines with farm labor during slack seasons	none			
116. Keep all bearings oiled or greased	none			
117. Keep cutting edges sharp	none			
118. Dispose of useless machines	none			
119. Keep polished surfaces greased	none			
120. Keep wood parts painted	little			
121. Clean, repair, and oil harness regularly	little			
122. Keep machines protected from weather when not in use	some			
123. Protect machines from livestock and poultry	some			
Buildings				
124. Study to adjust buildings to needs of farm	none			
125. Keep windows and doors in repair	little			
126. Keep foundations well drained	little			
127. Keep foundations in repair	little			
128. Keep roofs in repair	some			
129. Keep exposed wood surfaces painted	some			
130. Carry adequate insurance on buildings	some			

Good farm practices	Extra cash expense required to put practices into operation	Did you follow the practices last year?		
		Yes	Part	No
Buildings (continued)				
131. Have buildings equipped with lightening rods	some			
132. Keep effective fire extinguishers	some			
133. Provide ventilation for cows	some			
134. Provide ventilation for poultry	some			
135. Provide ventilation for hogs	some			
136. Provide ventilation for sheep	some			
137. Provide ventilation for horses	some			
Fences				
138. Study to adjust fences to needs of farm	none			
139. Keep fences so that stock cannot get into neighbor's fields	some			
140. Keep outside fences hog tight	some			
141. Keep gates in good repair and opening freely	some			
142. Hang gates in corners so as to avoid crowding of stock	some			
143. Avoid fence corners where stock is likely to gather	some			
General				
144. Have odd jobs done when rush seasons in field work or with livestock come	none			
145. Plan livestock breeding and feeding so that they will not interfere with important field work	none			
146. Operate large enough business to provide adequate income for family	some			
147. Organize farm business so as to make good use of available labor	some			
148. Organize farm business so as to make good use of available land and buildings	some			
149. Organize farm business so as to make good use of available power and machinery	some			
150. Arrange for large fields of uniform size	some			
151. Arrange fields so that they come as close to buildings and water as possible	some			
152. Plan livestock production to make good use of untillable pasture and roughage such as legumes needed for soil improvement, cornstalks and straw	some			

Good farm practices	Extra cash expense required to put practices into operation	Did you follow the practices last year? Yes	Part	No
Farm produce used on farm				
153. Produce milk, cream and butter for home use	little			
154. Produce eggs and poultry for home use	little			
155. Produce most of home used meat	little			
156. Can or cure meat for summer use	little			
157. Produce vegetables for home use	little			
158. Can or store vegetables for winter use	little			
159. Produce small fruit for home use	little			
160. Can small fruit for winter use	little			

Summary of Farm Practice Analysis

	Did you follow the practice last year? Number yes		
Practices followed (yes)			
Practices followed in part (part)			
Practices not followed (no)			
Total number of practices that apply to farm			

Printed in furtherance of the Agricultural Extension Act approved by Congress May 8, 1914, H. W. Mumford, Director Extension Service, University of Illinois.

FCM97-800-10-32

THREE YEARS' SUMMARY REPORT OF THE FARM BUREAU-FARM MANAGEMENT SERVICE FOR THE FARMS OF 33 COOPERATORS ON THE LOWER VALUED-LAND IN LIVINGSTON, MCLEAN, TAZEWELL, AND WOODFORD COUNTIES FOR THE YEARS OF 1929, 1930, AND 1931

J. B. Andrews, W. A. Herrington, M. L. Mosher, H. C. M. Case

The 33 farms included in this report are all on the lower-valued lands of the area. Most of them are on the timber soils along the Illinois and Mackinaw Rivers. The soils on these farms vary greatly. There is more of the yellow grey silt loam than any other one type. However, there is considerable yellow silt loam and most farms have some bottom land classified as mixed loam. A few farms in this group are on the edge of the timber soil area and have more or less of the dark prairie soils classified as brown silt loam with some black clay loam. There are a few sand land farms in Tazewell County. On these the soil varies from a fairly heavy brown sandy loam to a light blow sand.

For one who operates a farm on the lower-valued land, a comparison of his farm record with other farms on the same general quality of land will be more helpful than to compare his record with those of farms on what is usually a much more productive soil. It is for this reason that this supplemental report has been prepared.

Because the number of farms is so small, it was thought best not to divide these 33 farms into the more and less profitable groups. Most of the discussion of the differences between the more and less profitable groups of farms in the report for the 280 farms on the higher-valued land applies equally to farms on the lower-valued land. Each cooperator on the lower-valued land is urged to study that report.

While the tables on pages 2 to 8 of this supplemental report do not show a division of the farms into groups, the farm efficiency chart on page 9 does show the "high" and "low" farms for each of the factors measured on the chart.

Farms on the Lower-Valued Land of Livingston, McLean, Tazewell, and Woodford Counties; Averages for Three Years of 1929, 1930, and 1931

Table 1--Investments, Receipts, and Expenses

Items	Your farm	Average of 33 farms
Capital investments		
Land	$	$24 759
Farm improvements		4 033
Livestock--Total		2 817
Horses		605
Cattle		1 418
Hogs		528
Sheep		99
Bees		2
Poultry		165
Machinery and equipment		1 641
Feed, grain, and supplies		2 106
Total capital investment	$	$35 356
Receipts and net increases		
Livestock--Total	$	$ 2 549
Horses		---
Cattle		287
Hogs		1 032
Sheep		30
Bees		1
Poultry		85
Egg sales		187
Dairy sales		927
Feed, grain, and supplies		387
Labor off farm		65
Miscellaneous receipts		13
Total receipts and net increases	$	$ 3 014
Expenses and net decreases		
Farm improvements	$	$ 191
Horses		4
Miscellaneous livestock		---
Machinery and equipment		352
Feed, grain, and supplies		---
Livestock expense		46
Crop expense		184
Hired labor		259
Taxes		271
Miscellaneous expense		47
Total expenses and net decreases	$	$ 1 354
Receipts less expenses	$	$ 1 660

Farms on Lower-Valued Land of Livingston, McLean, Tazewell, and Woodford Counties; Averages for Three Years of 1929, 1930, and 1931

Table 2--Farm Earnings

Items	Your farm	Average of 33 farms
RATE EARNED ON INVESTMENT	%	2.19%
Inventories--beginning of year	$	$35 356
Inventories--end of year		35 010
Change in inventories		-346
Total cash sales during year		4 431
Total cash expenses during year		2 425
Cash balance for year		2 006
Receipts less expenses	$	$ 1 660
Total unpaid labor		886
Operator's labor		629
Family labor		257
Net income from investment and management		774
Return to capital and operator's labor and management		1 403
5% of capital invested		1 768
Labor and management wage	$	$ -365
Net income per acre		$ 3.57
Family living furnished by farm		
Farm products used in home	$	$ 346
Number in family		4.7
Farm produce used per person	$	$ 74

Table 3--Farm Expenses

Items	Your farm	Average of 33 farms
Total expense per acre of farm	$	$ 10.34
Selected items of expense		10.32
Farm improvements		.88
Machinery and equipment		1.63
Miscellaneous livestock expense		.21
Miscellaneous crop expense		.85
Hired and home labor		5.28
Taxes		1.25
Miscellaneous		.22
Livestock and grain decreases		.02
Horses		.02
Miscellaneous livestock		--
Feed, grain, and supplies		--
EXPENSE PER $100 GROSS INCOME	$	$ 74

Farms on the Lower-Valued Land of Livingston, McLean, Tazewell, and Woodford Counties; Averages for Three Years of 1929, 1930, and 1931

Table 4--Size of Business

Items	Your farm	Average of 33 farms
Total Man Work Units		388.4
On crops		154.0
On productive livestock		201.2
On horses		33.2
Size of farm--total acres		216.6
Percent of farm tillable		67.9
Percent of tillable land in crops		93.0
Total investments		$35 356
Total receipts and net increases		3 014
Value of feed to livestock		1 967

Table 5--Intensity of Business

Items	Your farm	Average of 33 farms
Gross income per acre	$	$13.91
Feed used per acre		9.08
Pounds of pork produced per acre		65.7
Man work units per acre		1.79

Table 6--Organization of Business

Items	Your farm	Average of 33 farms
Investments per Acre--Total	$	$163.24
Real estate		132.93
Land		114.31
Farm improvements		18.62
Operating capital	$	$ 30.31
Horses		2.79
Productive livestock		10.22
Machinery and equipment		7.58
Feed, grain, and supplies		9.72
Percent of income from feed, grain, and supplies		12.8%

Farms on the Lower-Valued Land of Livingston, McLean, Tazewell, and Woodford Counties; Averages for Three Years of 1929, 1930, and 1931

Table 7--Crop Yields

Items	Your farm	Average of 33 farms
Grain crops--bushels per acre		
Corn		36.3
Oats		36.9
Winter wheat		20.0
Spring wheat		18.6
Barley		19.4
Soybeans		12.9
Hay crops--tons per acre		
Timothy		1.0
Clover		1.1
Alfalfa		2.3
Clover and timothy		1.1
Soybeans		1.6
Crop index1/		82.2
Acres of above crops grown		128.2
Acres required at average yields		105.4

1/ The crop index is the percent of the average yields of all grain and hay crops, listed in Table 7, weighted according to the acres of each crop. It is calculated by dividing the total acres required at average yields to produce the amounts of crops grown on the individual farm by the total acres of those crops grown on the farm. The average yields of crops on the 280 farms on the higher-valued land were used as the basis of calculating the crop index on the 33 farms included in this report.

Farms on the Lower-Valued Land of Livingston, McLean, Tazewell, and Woodford Counties; Averages for Three Years of 1929, 1930, and 1931

Table 8--Percent of Tillable Land in Higher, Medium, and Lower Profit Crops

Items	Your farm	Average of 33 farms
Percent of tillable land in		
Higher profit crops--total	____%	66.2 %
Corn		38.6
Winter wheat		13.7
Alfalfa		5.2
Sweet clover		4.4
Canning and miscellaneous		4.3
Medium profit crops--total	____%	13.8 %
Spring wheat		1.8
Barley		1.9
Soybeans		3.1
Clover		4.2
Clover and timothy mixed		1.0
Miscellaneous		1.8
Lower profit crops--total	____%	20.0 %
Oats		18.0
Timothy		1.3
Blue grass		.5
Miscellaneous		.2
ALL HIGHER PLUS ONE-HALF MEDIUM	____%	73.1 %
Legumes left down		20.3
Crop following first year sweet clover		3.1

Farms on the Lower-Valued Land of Livingston, McLean, Tazewell, and Woodford Counties; Averages for Three Years of 1929, 1930, and 1931

Table 9--Amount and Efficiency of Productive Livestock[1/]

Items	Your farm	Average of 33 farms
Total feed to all productive livestock	$	$ 1 967
Beef cattle		538 (3)
Mixed cattle		785 (7)
Dairy cattle		1 052 (23)
Hogs		827 (32)
Sheep		130 (13)
Poultry		166 (33)
Total feed used per acre	$	$ 9.08
Total returns from productive livestock	$	$ 2 814
Beef cattle		541
Mixed cattle		991
Dairy cattle		1 563
Hogs		1 125
Sheep		80
Poultry		343
Total returns per acre	$	$ 12.99
Returns per $100 feed to all livestock	$	$ 143
Beef cattle		101
Mixed cattle		126
Dairy cattle		149
Hogs		136
Sheep		62
Total returns from all livestock if fed with average efficiency	($)	2 860
Livestock efficiency index[2/]		98.4
Poultry		
Returns per $100 invested	$	$ 218
Number of hens		125.9
Number of eggs per hen		96.8
Hogs		
Pounds of pork produced		14 224
Returns per 100 pounds pork	$	$ 7.67
Feed cost per 100 pounds pork		5.64
Dairy cows		
Number of cows milked		9.1
Pounds of milk per cow		6 723
Dairy returns per milk cow	$	$ 116

1/ A figure in parenthesis designates the number of farms which that item represents.

2/ The livestock efficiency index is the percent of the average returns from feed fed to all livestock weighted according to the amount of feed fed to each class of livestock. It is calculated by dividing the total returns from all productive livestock on a farm by the total returns from all livestock if each class had been fed with average efficiency. Average returns for feed fed on the 280 farms on the higher-valued land were used in calculating the livestock efficiency index.

Farms on the Lower-Valued Land of Livingston, McLean, Tazewell, and Woodford Counties; Averages for Three Years of 1929, 1930, and 1931

Table 10--Labor, Power, and Machinery Costs

Items	Your farm	Average of 33 farms
Labor		
Average number of men		1.65
Labor cost per crop acre	$	$ 8.57
Man work units per man		235.4
Labor efficiency index 1/		101.6
Power and machinery		
Average number of work horses		5.6
Percent of farms with tractors		64.6%
Percent of farms with trucks		38.4%
Feed cost per workable horse	$	$ 56
Costs per crop acre		
Horse feed and depreciation	$	$ 2.32
Machinery		2.57
Horses and machinery		4.89
Labor, horses, and machinery		13.46
Horse and machinery efficiency index 2/	_____	108.4

Table 11--Amounts and Prices of Some Products Sold

Items	Your farm	Average of 33 farms
Amounts sold		
Corn--bushels		783
Oats--bushels		360
Wheat--bushels		291
Pork--pounds		13 906
Milk--pounds		59 159
Eggs--dozens		659
Prices received		
Corn--cents per bushel	$	$ .76
Oats--cents per bushel		.34
Wheat--cents per bushel		.85
Pork--dollars per 100 pounds		8.53
Milk--dollars per 100 pounds		1.67
Eggs--cents per dozen		.27
Percent of average price received for all	_____	103.9

1/ There was an average of _____ man work units per man on farms having the same labor requirements on crops and the same on livestock as the farm for which this report was prepared.

2/ There was an average cost of $_____ per crop acre for horses and machinery on farms of the same size and with the same amount of feed used per acre as on the farm for which this report was prepared.

Farm Efficiency Chart

Rate earned	Gross income per acre	Factors that affect gross income per acre: Corn Bushels per acre	Oats Bushels per acre	All grain and hay crop yield index	% tillable land in higher profit crops	Feed per acre to productive livestock	Returns per $100 feed: cattle	Hogs	Sheep	Returns per $100 invested in poultry	Livestock efficiency index	Percent of average price received	Man labor efficiency index	Horse and machinery efficiency index	Expense per $100 gross income	Size of business Total man work units
6.2	44	53	59	110	88	29		190	120	370	144	125	134	206	54	736
The best one-fifth of the farms in each factor come between this line and the next line below.																
4.0	20	41	40	97	81	12		147	103	260	113	113	124	140	67	463
The second best one-fifth of the farms in each factor come between this line and the next line below.																
2.6	16	38	38	92	76	11		138	80	220	104	104	113	117	70	380
2.3	14	36	37	86	71	10		134	55	200	100	103	102	111	75	355
The middle farm in each factor comes to this line.																
1.9	13	35	36	84	69	8		131	50	190	97	102	96	92	78	340
The second lowest one-fifth of the farms in each factor come between this line and the next line below.																
1.2	11	33	28	75	65	5		115	25	152	92	100	88	80	90	295
The lowest one-fifth of the farms in each factor come between this line and the bottom line.																
-2.7	6	15	16	48	57	2		90	-12	74	64	91	70	52	157	233